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ABSTRACT

The purpose of the Project for the Advancement of Church Education (PACE) was (1) to test the hypothesis that INSTROTEACH workshops improve the competence of volunteer teachers, (2) to test the hypothesis that Learning Laboratory training improves the competence of volunteer teachers, and (3) to conduct studies on the correlation between teacher competency and selected teacher characteristics. The results of the research showed that the workshops are an effective means of improving teacher competence. The results also were sufficiently encouraging to suggest that the laboratory treatment could be developed further. The analysis of the correlated studies of the teacher s in PACE suggested that INSTROTEACH may be in some degree a measure of teacher personality. The project staff also pursued the following objectives: (1) to conduct and report studies on laboratory student attendance, (2) to report related studies on church school enrollments, and (3) to develop attainable objectives toward improvement of volunteer teaching in the future with recommendations for practical steps to attain them. Annexes are attached which contain articles by the Project Director and Technical Assistant, a memorandum on research design selection, and a detailed evaluators report. Eleven appendixes are also included which contain tables, lists of components , and definitions. (RC)

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EDUCATION FOR VOLUNTEER TEACHERS

A Report on the Project for the Advancement of Church Education (PACE)

1968 - 1970

Locke E. Bowman, Jr.
Project Director

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EDUCATION FOR VOLUNTEER TEACHERS

A Report on The Project for the Advancement

of Church Education

1968-1970

Locke E. Bowman, Jr., Director

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FOREWORD

The report that follows is an outline of programs conducted and research completed in the Project for the Advancement of Church Education (PACE), March 1, 1968 - March 1, 1970. This project was devoted to the improvement of teaching competence of volunteers in the churches.

The report itself is in two major parts. The material in the first part is a rapid survey of the background, the actual programs, and the major results -- written in a style intended to be understandable to the layman in the field of educational research. The remainder of the report, especially Annexes II and III, was prepared by the professional consultants who served throughout the Project period as designers and evaluators of the research. Their material is written in the special language of the researcher.

The Project Director is deeply aware of the frustrations and difficulties to be encountered in trying to portray just what happened in such a two-year venture, within the limitations of a format such as project reports require. He did keep extensive diaries throughout the two years (six full notebooks), and it is his intention to translate much of this material into future publications that should prove beneficial to church educators, especially the volunteer teachers.

The Project acknowledges gratefully the encouragement and cooperation provided especially by the following persons: Mr. Charles G. Williams and Mr. John Lynn, of the Lilly Endowment, Inc.; Dr. Oscar J. Hussel and Dr. Donald L. Leonard, of the United Presbyterian Board of Christian Education; the Rev. John F. Shaw, Mr. William B. Worthington, Mr. Paul A. Smith, Dr. Paul David Sholin, Mr. Tom L. Larsen, Mrs. Hugh M. Hofmann, and the Rev. Dale L. Brubaker, of The Arizona Experiment Board of Directors (1968-1970).

The work of the PACE Advisory Committee is especially acknowledged. The following persons gave generously of their time during the two years: The Rev. Ivan Burnett and Mrs. Robert H. Benton, Jr., representing the United Methodist Church; the Rev. Gus Tuttle, of the Episcopal Church; Mr. Lew S. Griffith, Mrs. Roe B. Lewis, Mr. Alonzo T. Spang, Sr., and the Rev. William Vogel, of the United Presbyterian Church; the Rev. Boyd Baker, of the American Baptist Church; Mrs. Robert R. Pettit and the Rev. Frances Shorrock (Miss), of the Christian Church (Disciples of Christ).

Mrs. Hugh M. Hofmann, Mrs. Robert H. Benton, Jr., and the Rev. and Mrs. Donald E. Charles (Disciples of Christ) served on the Curriculum Selection Committee for the Learning Laboratory.

The Director acknowledges gratefully the assistance provided by Mr. Jon McKallor, of St. Daniel's Roman Catholic parish, Scottsdale, Arizona, in the compilation of the bibliography for this report.

Special thanks are due to the officers and members of Valley Presbyterian Church, of Scottsdale, Arizona. Without their support and assistance, the Project could not have happened.

It would be impossible to express adequately the Project's appreciation for the gifts of funds that came from Lilly Endowment, Inc., Indianapolis, the United Presbyterian Board of Christian Education, Philadelphia, and the private donors (particularly the one whose large, anonymous gift made it possible to begin the programs in early 1968).

The Director acknowledges the excellent work of the Technical Assistant, Mr. Donn P. McGuirk, whose untiring devotion to the tasks at hand and constant loyalty to the Project merit special commendation. The same expression of thanks must be offered to Mrs. Irene C. Bockmon, Mrs. Charles Haydon, and Mr. George L. Vinnedge, who worked behind the scenes as capable secretaries, bookkeepers, and public relations experts.

This report is submitted to the donors and to other interested educators in the hope that it will serve to stimulate further research and the development of more creative programs for the training of volunteer teachers in the churches.

Scottsdale, Arizona

June, 1971 -- Locke E. Bowman, Jr.

SUMMARY OF THE REPORT

I. PROBLEM AND BACKGROUND

Communication of our moral and religious heritage requires major improvement in the efforts of volunteer teachers in the churches. For many years these volunteers have shouldered the heaviest portion of the burden for teaching children and youth.

In the last ten years, enrollments in church classes have been declining. Among the reasons for this, which are likely to be complex, is the fact that teachers' lack of experience and training causes many students to drop out. On the assumption that it is appropriate to continue having classes in the churches, there is a need for better training programs to equip the teachers. Providing teachers with practical help in local settings is a major priority.

Through no fault of their own, many volunteer teachers in the churches are unaware of the critical roles they play. They do not realize that our heritage is at stake. They do not sense the urgency of their task and do not grasp the excitement of being communicators and interpreters, as well as facilitators of genuine inquiry on the part of their students.

Other volunteer teachers are keenly aware of their crucial responsibility and also of their need to improve. A few take advantage of training opportunities and demonstrate greater skill as a result.

Not an inconsiderable number of volunteer teachers grow discouraged and give up the teaching assignment. Directors and ministers of Christian education who are responsible for recruiting teaching staffs report increased difficulty in getting volunteers to agree to serve as teachers.

The Arizona Experiment, begun in 1965, was aimed at helping to provide improved teacher training for volunteers. By 1967, a new evaluative

instrument setting criteria for church teacher performance had been developed under the title of INSTROTEACH (Instrument for the Observation of Teaching Activities in the Church). The teacher-in-residence for the Experiment conceived the idea that a companion type of skills training for teachers should also be developed, in a laboratory setting equipped with videotaping devices for use in analysis of demonstration and practice teaching.

A two-pronged effort at improving volunteer church teachers' competence was proposed as a possible solution to the problem of providing better training and possibly reversing the declines in enrollment.

II. PURPOSE AND OBJECTIVES

The Project for the Advancement of Church Education (PACE), in the years 1968-1970, involved two separate programs:

A. INSTROTEACH workshops, to bring to volunteer teachers a set of criteria by which to judge effective teaching and evaluate their own efforts.

B. Establishment and operation of a permanent Learning Laboratory in a parish setting, to develop and demonstrate practical training procedures, innovations in classroom practice, and training materials.

Both programs were evaluated by educational personnel from Arizona State University. They pursued the following research objectives:

A. To test the hypothesis that INSTROTEACH workshops improve the competence of volunteer teachers.

B. To test the hypothesis that Learning Laboratory training improves the competence of volunteer teachers.

C. To conduct studies on the correlation between teacher competency and selected teacher characteristics.

The following additional objectives were pursued by the Project staff:

A. To conduct and report studies on laboratory student attendance.

B. To report related studies on church school enrollments.

C. To develop attainable objectives toward improvement of volunteer teaching in the future, with recommendations for practical steps to attain them.

The PACE findings are to be disseminated in various forms by the United Presbyterian Board of Christian Education.

III. PACE RESEARCH

A. Overall Design

Five major experiments were conducted in a research design aimed at evaluating the effects of the two training programs. An experiment consisted of a group of 24 to 48 people, randomly assigned to treatment groups: (1) workshop; (2) laboratory; (3) control. In all, 168 people were involved.

Two minor experiments involving a small number of teachers in a pre-test, post-test design were also conducted.

B. Workshop Program

The instrument known as INSTROTEACH (27 observation and interview scales for measuring teaching effectiveness) was further refined, and training workshops were conducted in the experimental periods.

Findings: Overall, the workshops produced greater competency than the control groups, with significance measured at the .01 level. It was concluded that the workshops are an effective means of improving teacher competence.

C. Laboratory Program

Whereas the workshop program had been worked out and tested in pilot events, the laboratory had to be developed during the PACE period by the Project Director. The Clara B. Worthington Learning Laboratory was established in Valley Presbyterian Church, Scottsdale; it consisted of a model classroom environment equipped with remotely-controlled videorecording equipment.

Training designs were developed and schedules adopted to permit teachers to observe demonstrations and do practice teaching in the laboratory. The Project Director provided instruction and critical analysis.

Findings: In one of the five experiments, the laboratory teachers showed a significantly higher level of competence than the controls (at the .05 level). In two of the experiments, the laboratory teachers ranked first among the three groups in level of competence. The results were sufficiently encouraging to suggest that the laboratory treatment could be developed further.

D. Teachers' Characteristics

General data on characteristics were collected from the 168 experimental teachers, to find their sex, age, religious denominations, and teaching experience. Thirty-one (31) were male; 137 were female. Fifty-nine (59) were under age 30; 109 were over 30 years of age. Nine denominations were represented: United Presbyterian, 85; United Methodist, 32; United Church of Christ, 19; Episcopal, 12; American Baptist, 8; Roman Catholic, 4; Christian Churches (Disciples), 4; Reformed Church in America, 2; Church of Jesus Christ of Latter Day Saints, 2.

Of the total, 64 teachers indicated no previous training connected with church teaching.

A program of tests was administered to investigate the relationships, if any, between the teachers' competency and the following characteristics: personality, mental ability, attitudes toward pupils and teaching, value structures, and knowledge of church education.

Findings: The analysis of these correlated studies of the teachers in PACE revealed a complex interrelatedness of the 27 INSTROTEACH scales and the 25 factors in the Structured/Objective form of the Rorschach Test (used to measure personality of the teachers). It was enough to suggest that

INSTROTEACH may be in some degree a measure of teacher personality. The other tests (Henmon-Nelson test of mental ability; Minnesota Teacher Attitude Inventory; Allport-Vernon-Lindzey Study of Values, and the PACE Test on Church Education) failed to produce data suggestive of anything more than chance relationships.

E. Laboratory Student Attendance

Attendance records of students in all seven laboratory training periods were analyzed to obtain percentage of attendance in relationship to enrollment. These were compared with the estimated average percentage of attendance in churches of all major denominations in the Phoenix area, for the comparable periods of time (four to six weeks in duration).

Findings: Overall percentage for demonstration classes was 89.1; for practice sessions, 84.2. Both percentages were well above the average for students in the area (estimated at 60 to 70 per cent), suggesting that attendance is better when teachers are making a conscious effort to demonstrate improved teaching skills.

F. Church School Enrollments

A group of ten randomly selected United Presbyterian Churches in the Phoenix area were studied, to determine possible relationship between PACE participation by their teachers and the trends in their church school enrollments. Five churches were identified as high participators in PACE, and five were low participators.

Findings: The high participating churches showed a 1.0 increase in their church school enrollments in the years 1968 and 1969; the low participating churches showed a net loss of 30.8 per cent. The study implied that churches desiring to maintain the level of their enrollment, or possibly improve it, should give attention to participation by their teachers in training programs of the type provided by PACE.

IV. OTHER PACE ACTIVITIES

The Project Director conducted nine special INSTROTEACH workshops throughout the country; assisted in a training seminar for INSTROTEACH leaders; participated as a consultant in two public school IOTA workshops; supervised production of numerous materials produced by the PACE staff; conducted extensive correspondence, and wrote frequently about the Project for publications.

V. RECOMMENDATIONS

1. To denominational boards and agencies in the field of church education: It is recommended that the INSTROTEACH workshop program become a regular part of major denominational teacher training efforts. The workshops provide a much-needed common frame of reference for determining what is expected of a volunteer teacher; in that sense, they represent a good beginning for planned programs of teacher education. Not only do the workshops help teachers to diagnose areas of strength and areas in which they need improvement, but also they motivate volunteer teachers to seek further training and to work toward self-improvement.

2. To educational curriculum planners in colleges, universities, and seminaries: It is recommended that INSTROTEACH workshops be offered as a part of the regular curricula of departments and colleges of education, at both undergraduate and postgraduate levels. The graduates of these institutions are the logical source of personnel for conducting future training events for volunteer and professional teachers. They need the basic insights provided by the INSTROTEACH process.

3. To the Board of Directors of the Arizona Experiment: It is recommended that the Learning Laboratory operation be continued in order to refine the training techniques, develop more training directors, and carry on

further research. Toward these ends, the following possibilities should be considered:

a. Developing additional centers and mobile laboratories.

b. Relating the Laboratory's work to departments of education in colleges, universities, and seminaries.

The need for expanding such practical training programs to make them available to a maximum number of professionals and volunteers is self-evident; massive demonstration of effective teaching, in many local settings, is required if teaching is to be re-cast in new, vivid images.

4. To local planners and decision-makers in the field of education: It is recommended that teachers should be exposed in greater numbers to both workshops and learning laboratory training (in a planned sequence). Since workshops are diagnostic and motivational, the teachers who take part in them should enter concomitant programs designed to enhance their particular skills in the classroom. Laboratory training focuses in detail on these essential skills. Evidence further suggests that participation in both forms of training serve to improve student enrollments and average attendance.

5. To researchers in the field of church education, it is recommended that further research and analysis be conducted in the following areas:

a. The relation of teaching competence measurements to tests related to personality structure. Inasmuch as the PACE research produced evidence that INSTROTEACH and the S/O Rorschach test are interrelated in a complex way, it is possible that future studies would point the way to achieving measurement of competency and personality structure in a single instrument.

b. The relationship of student attendance at church classes and the competency of their teachers, together with studies of factors motivating students to attend church classes. If improved teaching competence is indeed

a major factor in improving pupils' church school attendance records, the case for teacher training programs is reinforced; and a major problem may be potentially reduced (i.e., haphazard attendance at church classes by students of all age groups, as reported frequently in the churches).

c. The relationship of church school enrollments to programs of teacher training in which the staffs participate. If wide participation in effective training programs on the part of the teachers increases student enrollment, the case is further strengthened for expanding such programs as those developed in PACE.

EDUCATION OF THE VOLUNTEER TEACHER: A REPORT ON THE PROJECT FOR THE ADVANCEMENT OF CHURCH EDUCATION (1968-1970)

I. PROBLEM AND BACKGROUND

Communication of our moral and religious heritage requires major improvement in the efforts of volunteer teachers in the churches.

For many decades the major portion of the formal teaching of children and youth in the churches of America has been the work of volunteers. The Sunday School movement, a relatively independent development later incorporated into denominational structures as "Christian education," relied heavily on the willingness of volunteers to conduct classes for children and youth. Indeed, much of the vitality of the movement has been due to this factor of heavy involvement of laymen from diverse backgrounds.

The number of teaching personnel remains fairly steady. But in the last ten years, major denominations have experienced annual declines in enrollment for church classes. While the segments of the national population in the age groups of elementary and secondary grades remain proportionately high, the students have been attending fewer classes in their churches.

The reasons for the decline are apparently complex and interrelated. In no small part, it is due to major shifts in priority within the value systems of the total society. Ever since the heavy post-Sputnik stress upon science in the public school curricula and the consequent focus upon innovative approaches to the teaching of academic subjects, the life of the typical American school boy or girl has undergone gradual but nonetheless dramatic changes. In many instances the students have been under excessive pressure to achieve; there has been less time for leisure, and daily schedules have been heavily programed. Church programs have sometimes been removed from students' personal priorities because of the greater demands of school.

Universal acceptance of television fare as a part of the daily diet of even the youngest child has altered patterns of family life. In many homes, time formerly given to reading and conversation has often been preempted by the viewing of programs. A relatively small portion of the programs serve as stimuli to study, discussion, and serious reflection.

It has been argued that television has changed patterns of communication so that traditional modes of imparting our heritage (via the printed page and through personal story-telling) have to a considerable degree been displaced or rendered ineffective. Possibly a combination of the traditional modes with television (or other newer media) may serve us better than the former means alone.

Further, there has been a perceptible turning away from membership in organized churches. Partly, this has resulted from frank public assertions by many persons, including some church and theological leaders, that beliefs of the Judaeo-Christian heritage are no longer relevant or even consistent with truth.

Coupled with this so-called "new atheism" has been widespread controversy among the faithful, who may not be subject to as many theological misgivings or doubts but who cannot agree on the churches' primary role in modern society. Some have pleaded for more active involvement of the church in social, political, and economic issues -- and for priorities in budgeting that would eliminate many of the traditional programs of the church (including educational, evangelistic, and mission agencies). Others have argued for quite an opposite emphasis, calling for more evangelical approaches to preaching, teaching, and other forms of personalized ministry. Many laymen, bewildered if not discouraged by the debates, have apparently left the churches and withdrawn their financial support. Rather than take up the cudgels on such issues, they have retreated from the scene of organized religion; they no longer

participate in church programs, and their children are not enrolled in church classes.

Full and accurate analysis of the current decline must await a better perspective on the period of history through which we have been passing. It seems safe to say, however, that the following factors have been at work:

1. Secular emphases in public education and in the general culture have minimized the role of religious instruction -- in effect denying it the priority it once enjoyed.
2. Polarized points of view within churches themselves have tended to reduce lay participation in the traditional forms of organized religion, including the educational programs.
3. Varying combinations of 1. and 2. (above) have produced personal apathy and/or rejection with respect to the concept of religious instruction for today's children and youth. Many parents have expressed ambivalence on the issue, confessing that their uncertainty leads them to a position of neutrality bordering on indifference.

What, then, is the role of the thousands of volunteer teachers who have been recruited to assist in the continuing educational ventures of the church? How do they approach their tasks? What preparation do they have for serving in such positions at a time like the present?

In most churches it is still the rule rather than the exception that teachers are provided with space, equipment, and materials (in varying quantities and quality), and asked to proceed with their work. They are given minimal help in how to teach.

Probably no more than five per cent of the volunteers who teach take part in adequate programs of teacher education.[1]

Thus the teachers in the churches face a genuine dilemma. They have few personal images of effective church teaching. They have few models to rely upon, and they tend to follow only the models they know -- the church classes of their own childhood and youth. These models are likely to be inconsistent with sound educational practice, and open to question in these days of educational innovation.

Provided with few alternatives, volunteer teachers frequently adopt a style of teaching that minimizes student participation and features a high percentage of teacher talk. The end result may be a program of inept indoctrination rather than an educational experience tailored to the needs and abilities of students.

Teachers' lack of experience and training produces vacuous classroom sessions for students whose own attendance is generally on a strictly voluntary basis. Given a choice of attending or not, many boys and girls -- especially at the older age levels -- readily elect to forego church classes.

Where students are motivated by meaningful teaching strategies and develop satisfactory relationships with their teachers, they are less likely to drop the classes; given a choice under these positive conditions, they continue to attend.

Thus we must add another likely factor that contributes to a decline in church enrollment: the apathetic attitude of students themselves. It is an

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[1]In 1964, studies showed 43 per cent of United Presbyterian church school teachers had no pre-teaching training. Another 24 per cent learned only as assistant or substitute teachers in the church school. Another 20 per cent had taken college or other non-church courses in teacher training. Only 14 per cent had received any teacher training offered by the church, locally or elsewhere. More recent, up-dated studies indicate that this situation remains unchanged. (See Church School Teachers in the United Presbyterian Church, by Oscar J. Hussel and Gerald Klever, page 111.)

attitude engendered by a situation in which they are deprived of trained, competent teachers. The students fail to detect a purposeful structure in which relevant learning will be possible for them.

However one looks at what remains of the churches' educational structures, the key to the situation is the teacher. Whether he be professional or volunteer, whether he be paid or without stipend, whether his stance is conservative or liberal -- all these matters are of interest but not crucial.

The crucial matter is his competence in the actual encounter with students.

The key question is: Does he know how to teach the boys and girls of this present generation?

The teacher, of course, cannot be held responsible for the complex conditions that have led to a current decline in organized religion. He is not personally responsible for a modern culture that tends to reject its spiritual moorings.

But to a large degree the teacher is accountable for the loss of student interest. He is responsible for improving his own classroom skills. He is the vital link between his students and their moral and religious heritage.

Through no fault of their own, many volunteer teachers in the churches are unaware of the critical role they play. They do not realize that our heritage is at stake. They do not sense the urgency of their task and do not grasp the excitement of being communicators and interpreters, as well as facilitators of genuine inquiry on the part of their students.

Other volunteers are keenly aware of their crucial responsibility and also of their need to improve. A few take advantage of training opportunities and demonstrate greater skill as a result. Not an inconsiderable number grow discouraged and give up the teaching assignment. Directors and ministers of Christian education who are responsible for recruiting teaching staffs report increased difficulty in getting volunteers to agree to serve as teachers.

The preceding general observations about teaching in the churches are all posited on the assumption that it is both appropriate and imperative for organized religious institutions to maintain and support programs of instruction for children and youth. Even this assumption, however, is open to debate in the present welter of conflicting viewpoints about nearly every activity in our society. There are many strong exponents of the theory that the church school has had its day, that it should at least be allowed to die if not actually hastened to its demise. Spokesmen for such a viewpoint call for "new styles of learning" that will put greater responsibility for communicating and examining religious values on parents in the home. They advocate forms of community experience (as yet largely theoretical and untried) that will take the place of formalized teaching. The role of teacher is thus virtually disdained.

Against this background, the author of this report has consistently taken a position (in previous publications and in the course of the Project described herein) that may be summarized in the following clauses:

1. That the dominant learning style in our western civilization is formalized. It calls for a transaction between teacher and student. That transaction may take a wide variety of forms, ranging from the highly structured situation to a very flexible, open form of encounter. But to omit the role of teacher from the churches invites difficulties and is counter-productive in the lives of students.

2. That it is still a viable option to depend upon trained volunteers to do the bulk of the teaching in the churches. It is not only possible but desirable that persons in the Christian community should fulfill this role and give themselves to it with dedication and a sense of vocation.

3. That the details of when and where teachers and students meet, and under what forms of organizational structure, are of less significance than

the quality of what happens when they are together. It is possible to teach well in a traditionally structured Sunday School; by the same token, it is possible to teach badly in a highly innovative new system of scheduling and with the best kinds of facilities.

4. That our primary task at this juncture in history is to focus on adequate training of the teacher in order to provide him with new images of what is possible and how to be more skillful at achieving desired objectives.

5. That our ancillary task is to take advantage of new patterns of communication, such as video and sound, that have frequently taken priority over reading as a home pursuit.

6. That the declining enrollments in classes may possibly be reversed if the church becomes sufficiently supportive of effective teachers.

7. That an attitude of hope should prevail over despair, in church education as in all activities in which the Christian is engaged. It is no expression of false optimism to work hard at improving the instructional opportunities now being provided for students; further, it is possible that predicted trends of further decline will prove unduly pessimistic.[1]

These convictions were strengthened during the years from 1955 to the present. For the first ten of those years, the author was an editor of senior high school curriculum materials for use in United Presbyterian churches. He had frequent opportunities to visit and correspond with teachers who made use of the published resources for which he was responsible. Repeatedly, he was struck with the expressed difficulties of the volunteers in mapping their teaching plans. They lacked the basic skills teachers require for effectiveness. More could be done to help them acquire these skills.

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[1]This note of hope was sounded in the book, Straight Talk About Teaching in Today's Church, by Locke E. Bowman, Jr. (The Westminster Press, Philadelphia, 1967). That volume was a partial report on discoveries made during the action research stage of The Arizona Experiment, which had begun in 1965.

An inventory of training opportunities available to the typical church teacher revealed that, as a general rule, they fell into two categories: (1) Events in which experts lectured and led discussions about teaching (in fairly abstract terms and without adequate reference to real situations); (2) occasional demonstration schools in which teachers observed someone else teaching students but in which there were no clearly defined criteria or objectives, in which little provision was made for a carry-over of what had been observed into actual practice, and in which little if any followup or supervisory assistance was given.

At best, hardly more than one out of twenty teachers in the average church would be involved consistently in the kinds of training made available.

In 1964, the author began to formulate concrete proposals for some new approaches to the training of volunteer teachers. In a foundation paper first prepared for a special committee of the United Presbyterian Synod of Ohio, he articulated the concept of a regional teacher-in-residence whose task would be to itinerate among churches as well as to teach in a special center. He would engage in action research to determine some viable means of helping teachers to do a better job.

The paper was later shared with a local group in the United Presbyterian Synod of Arizona. Through the generosity of the late Henry R. Luce and other Arizona donors, and through the helpful collaboration of the United Presbyterian Board of Christian Education, the author was given a two-year leave in which to test out the concept of a teacher-in-residence in what was called The Arizona Experiment in Biblical Studies and Teaching.

From the years 1965-1967, he maintained residence in Scottsdale, Arizona, and itinerated among the churches of the State. A dominant pattern of operation emerged:

Pastors of churches were responsible for making local arrangements and setting up events to be attended by teachers. These often included sessions on Biblical and theological content. But the most popular type of event was the teaching demonstration. The teacher-in-residence would work with students of a given age level in their own classroom, making use of only those resources and equipment presently available. He would always attempt to teach a study session that would later be taught in a unit of study for which observing teachers were responsible. Thus, the observers would be getting ideas they could try for themselves.

In a survey conducted in 1967 by the Bureau of Educational Research and Services, Arizona State University, a large number of persons who had been exposed to the work of The Arizona Experiment indicated that the teaching demonstrations had been the most helpful aspect of the visits from the teacher-in-residence. Further, they responded overwhelmingly that the work of "the Rev. Mr. Bowman" could be most adequately described as that of teacher rather than that of director of programs, administrator, or preacher.

The survey demonstrated conclusively that the teacher-in-residence concept was sound and workable. Informally collected evidence suggested that teachers taught differently as a result of their exposure to the local demonstrations.[1]

Concurrently with his itinerant teaching, the teacher-in-residence began to explore the possibility of developing, for church use, a new instrument for evaluating teaching competence. He became familiar with the Instrument for the Observation of Teaching Activities (IOTA), then only

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[1]This unpublished survey was submitted to the United Presbyterian Board of Christian Education in May, 1967, by the Arizona State University Bureau of Educational Research and Services. Consultants who prepared the report, under the title, "Evaluation of the Arizona Experiment in Biblical Studies and Teaching," were Dr. Thomas H. Metos and Dr. Keith R. Van Wagenen, both of the Arizona State University's College of Education faculty.

recently introduced in Arizona as a workshop program of in-service training for teachers and supervisory personnel in public schools. The IOTA had been developed in California, primarily as a tool for use by supervisors, and was being refined at Arizona State University under the leadership of Dr. R. Merwin Deever, College of Education.

A grant of funds was obtained from the United Presbyterian Board of Christian Education to enable the Arizona Experiment to collaborate with the Bureau of Educational Research and Services, Arizona State University, for developing such a church-related instrument. Through the month of September, 1966, a group of persons recruited by the teacher-in-residence, met repeatedly with Dr. Deever, Dr. Howard J. Demeke, and Dr. Raymond E. Wochner, to perfect a first draft of a document that included a definition of church teaching entitled "Five Areas of Church Teacher Competence."

Also developed was an instrument for which the teacher-in-residence coined the ideogram, INSTROTEACH (Instrument for the Observation of Teaching Activities in the Church). This instrument, given a trial run by the developers, appeared to have possibilities as a piece that would help the volunteer teacher to acquire criteria for competence and to set goals for self-improvement based on self-evaluation. The instrument consisted of twenty-seven (27) five-point scales and scale descriptions, defining teacher behavior at levels of performance ranging from optimum to considerably below standard.

A pilot workshop for thirty-six professionals and volunteers in the Phoenix metropolitan area was held in January, 1967. Their participation and enthusiasm in the workshop process (forty hours undertaken over a two-week period) suggested that the INSTROTEACH approach might be a significant breakthrough to help volunteer teachers acquire better images of effectiveness in their roles.

It was also clear that many church teaching situations were so haphazard and chaotic in nature that they did not lend themselves to the use of an observation instrument such as INSTROTEACH. To the teacher in-residence this signaled the need for a demonstration center in which church teaching could be done consistently at a higher level of effectiveness, and in which volunteers could study and practice their teaching skills under supervision. He considered the possibility of developing such a center to employ videotape recordings extensively for analysis and evaluation, as a teaching tool, and as a major means of communication. Ultimately, he decided to resign from the Board of Christian Education staff in order to pursue the development of a learning laboratory in Arizona.

In the summer and fall of 1967, further refinements in INSTROTEACH were accomplished, and the serious pursuit of funds for an extensive research project in the training of volunteer teachers in the church was begun.

The problem under attack in the proposed Project for the Advancement of Church Education (PACE), briefly summarized, was how to provide better training for the volunteer teacher. The background data suggested that a two-pronged effort was required: (1) Assistance for the teachers that would lead to their own development and adoption of criteria for effective teaching, and to their continual engagement in self-evaluation; (2) a laboratory setting in which teachers could observe and practice improved techniques, under supervision, and thus acquire fresh images of what constitutes "good" (effective) practice in the church classroom.

II. PURPOSE AND OBJECTIVES

The Project for the Advancement of Church Education (hereinafter PACE) was established for the two-year period, March 1, 1968, to February 28, 1970, with grants from the Lilly Endowment, Inc., the United Presbyterian Board of Christian Education, private donors, and the Ampex Corporation. In all, a budget of more than $116,000 was required for the programs and research carried out under PACE. Project Director was the Rev. Locke E. Bowman, Jr.

This ecumenical project for training volunteer teachers in churches and improving their classroom practice involved two interrelated programs that were intended to support and reinforce each other:

(1) Workshops on the use of a unique evaluation instrument (INSTROTEACH, which had been developed in 1966-1967).

(2) Learning Laboratory training in which teachers would observe master teachers working with students, then do practice teaching under supervision.

Although initiated by the United Presbyterian Church, the Project sought the widest possible participation by teachers in other denominations.

A. Workshop Program

The INSTROTEACH workshops were conducted in Arizona and in nine other regions of the United States during the two-year program, as a joint effort of the PACE Director and consulting personnel of Arizona State University.[1] The specific objectives of the workshop program were:

1. To bring to volunteer teachers a set of criteria by which to judge effective teaching and to evaluate their own efforts. (Briefly, they were to be given a fresh image of what constitutes "good" classroom practice.)

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[1]A tenth workshop, scheduled for the State of Wisconsin, was postponed until the spring of 1971. In each of these PACE-related workshops the participants received a brief report on the research underway, but they were not directly involved.

2. To increase teachers' competence by giving them confidence to try a variety of tested classroom procedures they would observe and learn about in the workshop.

3. To enhance the teachers' satisfaction in their roles by offering them personal encouragement and support.

4. To provide training for potential workshop leaders from the entire country.

B. Laboratory Program

The Clara B. Worthington Learning Laboratory was established at Valley Presbyterian Church, Scottsdale, Arizona, and operated by the Director, with a full-time Technical Assistant, Mr. Donn P. McGuirk. Counsel was obtained from public school and university educators as well as members of the staff of the United Presbyterian Board of Christian Education. Members and staff of Valley Presbyterian Church gave much direct assistance. The specific objectives of the laboratory program were:

1. To continue development, testing, and evaluation of criteria for volunteer teachers and of intensive, practical training procedures in a parish setting.

2. To recommend innovations to participating churches for improving their teaching staffs in both quality and numbers.

3. To supply video-recorded and filmed segments of effective classroom teaching to be used in workshops and other teacher training events nationwide.

4. To publish findings as a contribution to national and other programs for improvement of volunteer teacher recruiting, training, and evaluation.

C. Evaluation

A detailed research design and appropriate statistical methods and computer facilities were employed to evaluate the results of both programs.

Dr. Thomas H. Metos and Dr. Frederick D. Levan, of the Arizona State University's College of Education faculty, were employed under private contract as the PACE evaluators. They supervised the selection of subjects and their random assignment to treatments, analyzed the observation and interview data, scored the tests that were administered, and wrote the summaries of compiled tables. The computer work was done by TransData, a Phoenix corporation.

The evaluators pursued the following research objectives:

1. To test the hypothesis that INSTROTEACH workshops improve the competence of volunteer teachers in the churches.

2. To test the hypothesis that Learning Laboratory training improves the competence of volunteer teachers in the churches.

3. To conduct studies on the correlation between teacher competency and the following teacher characteristics: (1) personality; (2) mental ability; (3) attitude toward pupils and teaching; (4) value structures, and (5) knowledge of church education.

D. Additional Studies

In the course of the PACE research, the Director conducted studies related to the attendance records of students who were enrolled in the Learning Laboratory classes. A study was also completed in relation to the church school enrollment patterns in churches whose teachers took part in PACE-related training. The Director maintained diaries with detailed records on all PACE activities. The objectives of these studies were:

1. To ascertain general response on the part of students to classes offered in the Learning Laboratory, as indicated by their percentages of voluntary attendance at demonstration and practice sessions.

2. To determine whether a statistically significant relationship existed between enrollment trends in church schools and the degree of participation in PACE training events on the part of the respective teaching staffs.

3. To review the total impact of the PACE programs in order to develop attainable objectives toward improvement of volunteer teaching in the future, with recommendations for practical steps to attain them.

E. Dissemination

Dissemination of findings and techniques developed by PACE is being carried out on a national level by the Board of Christian Education of the United Presbyterian Church, through its staff, its publications, and its contacts with other denominations. Further dissemination is currently in progress under the National Teacher Education Project (NTEP), the successor to PACE which has been established for the two-year period of March 1, 1970, to February 29, 1972.

III. PACE RESEARCH, 1968-1970

A. Overall Research Design

During the two-year period of PACE, a total of 168 teachers from nine denominations in the Phoenix metropolitan area were involved in the five major experiments conducted in the research aspect of the Project. News of the PACE training opportunities in workshops or laboratory reached teachers through Project newsletters, church bulletins, and by means of personal contact from educational leaders of the denominations. An ecumenical PACE Advisory Committee assisted in interpreting the Project.[1]

Teachers were registered for a "pool" of volunteers and were subsequently assigned randomly to one of the following treatment groups: (1) Workshop; (2) laboratory; (3) control. Registrations were open for each of the five major treatment periods. These periods, each six weeks in length, were scheduled as follows:

Experiment I: September-October, 1968, for teachers of Grades 1-8.

Experiment II: November-December, 1968, for teachers of Grades 1-4.

Experiment III: January-February, 1969, for teachers of Grades 5-8.

Experiment V: September-October, 1969, for teachers of Grades 1-4.

Experiment VI: October-November, 1969, for teachers of Grades 5-8.

See also Figure 1 and the accompanying notes regarding assignment of teachers to the groups.

Two other minor experiments were conducted, in which training was provided for the controls left over from previous groups, as follows: Experiment IV,

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[1]Chairman of the Advisory Committee was the Rev. John F. Shaw, also president of The Arizona Experiment. Membership on the committee included representatives of the following denominations: United Presbyterian, American Baptist, Episcopal, United Methodist, Christian Church (Disciples). The Experiment reported regularly to the United Presbyterian Synod of Arizona which had voted unanimously in October, 1967, to endorse the PACE proposal (prior to funding).

March-April, 1969, for teachers of Grades 1-8; Experiment VII, January-February, 1970, for teachers of Grades 1-8.

Figure 1
TREATMENT-BY-LEVELS DESIGN
FOR ASSIGNMENT OF PACE TEACHERS

Grade Levels Taught by Teachers	Laboratory Treatment (A_1)	Workshop Treatment (A_2)	Control Group (A_3)
L_1 Grades 1-2	4 teachers	4 teachers	4 teachers
L_2 Grades 3-4	4 teachers	4 teachers	4 teachers
L_3 Grades 5-6	4 teachers	4 teachers	4 teachers
L_4 Grades 7-8	4 teachers	4 teachers	4 teachers

EXPLANATION:

The pattern illustrated here is for Experiment I. A total of 48 teachers were involved; one-half of these (24) were observed in their own classrooms following the treatment period. They were observed and interviewed by teams of two trained observers.

For Experiment II, only Levels 1 and 2 were involved (teachers of Grades 1-2 and 3-4). Again, the total of 24 teachers were divided, with one-half (12) observed and interviewed by teams of two trained observers.

For Experiment III, 24 teachers of Levels 3 and 4 (Grades 5-6 and 7-8) were involved. Again, one-half (12) were observed and interviewed by a two-man team.

Following Experiment III, it was determined that the scores selected by the observer teams presented a very high degree of correlation. It was decided that one trained observer's data and scores would be just as reliable as the work of a two-man team. Consequently, in all subsequent experiments, the total group of teachers were visited in their own classrooms, each by one trained observer.

Experiments V and VI were, respectively, replications of Experiments II and III (except that all 24 teachers in each experiment were visited in their classrooms, as indicated above).

The minor Experiments IV and VII provided workshop and laboratory training for left-over control group members from previous experiments. The controls from Experiments I-III were used for Experiment IV; controls from Experiments V and VI were used for Experiment VII. These minor experiments employed a simple pre-test, post-test design.

In the treatment periods for the major experiments, teachers who were assigned to control groups were asked to continue teaching as usual, and no training was provided for them during the six weeks. Laboratory treatment was spaced over the full six weeks; workshops were held over two extended weekends at the end of each six-week period. Participants in workshop and laboratory were requested not to discuss their training experiences with others.

Immediately following the treatment periods, trained observers recruited by Arizona State University personnel visited randomly selected members of the three groups in each experiment (workshop, laboratory, control) in their own churches to collect objective data regarding their teaching performance. All were observed while teaching, and interviewed individually. The INSTROTEACH evaluative scales were applied to the data collected. The major findings reported below are based on analysis of the scores recorded by the trained observers.

Two additional treatment periods represented by Experiments IV and VII were scheduled principally in order to provide these persons with a meaningful experience in return for their patient cooperation as controls in the five major experiments.

Batteries of tests were also administered to the teachers in the experiments, and the analysis of these is reported in "D. Teacher Characteristics" (below).

B. Workshop Program

1. PROCEDURES

a. Refinement of the Instrument

At the inception of PACE, the Instrument for the Observation of Teaching Activities (INSTROTEACH) existed only in a 45-page dittoed edition. The basic definition of teacher competence was incorporated in the document and had not yet been published as a separate piece. Only three pilot workshops

had been held: Tempe, Arizona, January, 1967 (referred to under "PROBLEM" above, page 22); Scottsdale, Arizona, April, 1967; Philadelphia, Pennsylvania, September, 1967. The first two of these had been workshops for volunteer teachers as well as professionals; the third was for professionals on the national staffs of the United Presbyterian and United Church of Christ denominations.

The Instrument had undergone a complete editorial revision in January, 1968, as a joint effort of the developers and a special committee representing the two denominations previously named.

During the period, March 1-August 1, 1968, the PACE Director devoted a major portion of time to the continuing development of the Instrument. He was a consultant for a fourth pilot workshop held in Tempe, Arizona, in March, 1968 -- for additional professionals on the national staffs of the United Presbyterian and United Church of Christ denominations. He served as coordinating editor of the first published editions of the two booklets, FIVE AREAS OF CHURCH TEACHER COMPETENCE and THE EVALUATION OF TEACHING EFFECTIVENESS IN THE CHURCH (Workshop Manual).[1] He was also heavily involved in planning and conducting a five-week 1968 Summer Seminar in Arizona for twenty-four persons who subsequently were certified as INSTROTEACH Workshop Directors throughout the United States.

By September 1, 1968, the PACE office also served as the office of the newly-established INSTROTEACH Board, for which the PACE Director now served as Secretary-Treasurer. Published INSTROTEACH workshop materials were shipped from this location until March 1, 1971.

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[1]These booklets, published and distributed by The INSTROTEACH Board, have undergone multiple printings. Authors are R. Merwin Deever, Howard J. Demeke, Raymond E. Wochner, and Locke E. Bowman, Jr. (Available for purchase from The INSTROTEACH Board, P.O. Box 7041, Wichita, KS 67201, or from Westminster Bookstores.)

b. Conducting Workshops

The PACE research design required that maximum effort be made to avoid "contamination" of any one of the established experiment groups (workshop, laboratory, control) by one or both of the others. As indicated above, the teachers were asked not to discuss their training. To guarantee further that the two forms of training would be wholly discrete, it was determined that the Project Director would work closely with the laboratory group but would avoid any kind of leadership role in the workshops. The workshops were conducted under contract by Arizona State University personnel.

A pattern of workshop scheduling not previously tried was initiated in the first research period (September-October, 1968) and followed consistently throughout the duration of the Project. Participants were involved over two extended weekends (Friday evening, all day Saturday, and most of Sunday). They also arranged, as individuals or teams, to visit in one public school class during the intervening week. In all, each workshop represented approximately thirty-two contact hours for each participant.

The INSTROTEACH workshop content is outlined in Appendix J of THE EVALUATORS' REPORT (Annex III).[1]

It is important to note that the workshop procedures differed little from the process employed in IOTA workshops for public school personnel. The training techniques for these events had been refined in both California and Arizona during the 1960's, and INSTROTEACH itself had been in existence as a concept two years before PACE research began. It had undergone two major editorial revisions prior to the PACE experimental periods, and it had by then been tested in four pilot workshops (described above). The faculty men who

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[1]See also a detailed description of the workshop in the workshop manual (op. cit.). The manual is not available for purchase except to persons who have completed a workshop. Professional educators may obtain copies on loan, from The INSTROTEACH Board, P.O. Box 7041, Wichita, KS 67201.

led the workshops had been involved in the IOTA program for several years and had all worked intensively in the development of INSTROTEACH.[1]

2. FINDINGS AND CONCLUSIONS

Analysis of the research data collected in the five major experiments produced the following findings with respect to the workshop program:

Aggregate (all five major experiments): In a pooling of the experimental results, the aggregate data indicated an overall statistically significant difference between the competency of workshop-trained teachers over the control groups, at the .01 level.[2]

Experiment I: The workshop group showed a significantly higher post-treatment competency than the laboratory group. But the difference between the workshop group and the control group was not statistically significant at the established .05 level.

Experiment II: The workshop group showed a significantly higher level of competency than the control group, at the .05 level. They were a shade lower than the laboratory group.

Experiment III: The workshop group ranked below both the laboratory group and the control group, but not significantly so in either case.

Experiment V: The workshop group showed the highest scores, but they were not significantly above the other two groups.

Experiment VI: The workshop group showed the highest scores; but, as in the case of Experiment V, they were not significantly above the other two groups.

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[1]They were Drs. Deever, Demeke, and Wochner.

[2]Frequent reference is made here to "significant" levels. In its statistical sense, significance is determined at a level established by the evaluators. In the case of the PACE research, the established level was .05. "Significant at the .05 level" means that there is only one chance in 20 of error. "Significant at the .01 level" means that there is only one chance in 100 that the results come from accidental factors. It should be noted that the .05 level is regarded as a very rigorous test; many evaluators would settle for a less demanding level.

In support of the overall findings, workshop participants ranked first (among the three groups) in three of the five major experiments. In Experiments I, II, V, and VI, workshop teachers had developed greater competency than teachers who had experienced only the control condition, even though the difference was statistically significant only in the case of Experiment II. (In Experiment I only, the workshop teachers scored significantly higher than the laboratory-trained teachers.)[1]

The experiments failed to reveal any significant differences among workshop-trained teachers of the four age-level groupings (Grades 1-2, 3-4, 5-6, and 7-8).

In neither of the two minor experiments (IV and VII) were the data sufficiently conclusive for generalization. (See Annex III, THE EVALUATORS' REPORT, pages 105-124.)

3. IMPLICATIONS

The PACE research findings suggest that the workshops based on INSTROTEACH are an effective means of assisting church teachers to demonstrate greater competence in the classroom.

Advantages offered by this means of training volunteers are:

a. A workshop may be held in any location, with a minimum of equipment required. The focus of the events is upon visitation of church and public school classrooms in the vicinity of each workshop site.

b. The cost of a workshop program is considerably less than the expense required for maintaining schools and laboratories and personnel to operate them on a steady basis.

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[1]The key points in interpreting these findings are: (1) The number of cases involved in the aggregate of experiments is sufficient to allow better statistical evaluation; and (2) the statistical significance of the aggregate sample is at a very high level of reliability.

A belief in the potential of the workshop program led to the decision (in the spring months of 1968) to develop a corps of trained Workshop Directors *who could conduct the training nationwide.* Time and funds have been invested by major religious denominations, and the INSTROTEACH developers have continued their involvement as leaders of the program. By the end of 1970, there were more than 150 trained leaders (Certified and Assistant Directors) available throughout the United States and Canada, and the growth rate of this corps was expected to accelerate. The research data confirm the wisdom of this widespread implementation of the INSTROTEACH program.[1]

Further factors to be taken into consideration, however, are the following:

Workshops are chiefly an orientation procedure for the teacher. They provide key definitions and assist the volunteer teacher in acquiring initial diagnostic skills. They also provide a certain degree of motivation to the volunteer teacher, not only to continue teaching but also to improve in those general areas of competence measured by INSTROTEACH.

But workshops do not purport to provide the detailed "how to" ingredients of teaching, nor opportunities for sustained practice and refinement of techniques under supervision. The Learning Laboratory and its projected programs appear to have focused on what amount to "after-the-workshop" types of specific training for classroom practice. (See the article, "A Training Design," in Annex I.)

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[1]The INSTROTEACH Board, by arrangement with The Arizona Experiment, maintained its headquarters at the PACE offices until March, 1971. Under the leadership of the four developers, a large number of additional persons have been trained and certified as Directors and Assistant Directors of workshops.

C. Laboratory Program

1. PROCEDURES

a. *Establishing the Clara B. Worthington Learning Laboratory*

On March 1, 1968, the PACE learning laboratory concept existed only in brief written outline and in the mind of the Director. The initial task was to convert two bare rooms at Valley Presbyterian Church, Scottsdale, Arizona, into the first training laboratory of its kind for use in church education.

Ampex videorecording equipment was installed. Cameras and microphones in the learning laboratory are remotely controlled from a console in the office area thirty feet away, and do not distract from teaching activities.

The laboratory itself is a model classroom environment. It is carpeted throughout for acoustical control. The natural lighting is augmented by fluorescent fixtures, and additional reflected light for videotaping is provided by special portable quartz lights.

The teaching area is furnished with adjustable trapezoidal tables and chairs of differing heights for the various age levels. A large closet area provides storage space for all teaching equipment and materials. Considerable emphasis has been placed on the use of overhead and rear-screen projection, listening centers, study carrels, and other innovations in the media field, as well as devices for individualized instruction.

All equipment is installed by the Technical Assistant. He also designs and builds numerous pieces of equipment and is in charge of the display areas and media presentations. He takes responsibility for classroom arrangement for each demonstration or practice teaching session. (See the two articles by Donn P. McGuirk in Annex I, pages 77-100.)

b. Scheduling of Laboratory Sessions

The schedule originally adopted for the laboratory provided that teachers would spend two hours observing in the classroom during the week, then engage in evaluation and practice teaching on the following Saturday (morning or afternoon). Following Experiment I, this schedule was radically revised so that teachers did both their observations and practice sessions on Saturdays and returned on a weekday evening for further analysis and instruction. Both the schedules, however, provided for these essential elements in the thirty or so contact hours:

(1) Periods of instruction conducted by the Project Director.

(2) Observations of teaching demonstrations with children and youth.

(3) Practice teaching by the teachers-in-training, in teams or individually, employing the same segments of instruction used in the demonstrations, but with different groups of boys and girls.

(4) Analysis of videotape recordings of both demonstration and practice sessions, led by the Director.

A description of the training is given in more detail in an article entitled "A Training Design" (Annex I).

c. Training Content

Curricular materials used in the classes were chosen by an advisory committee. Selections were chiefly from the curriculum of the United Methodist Church, supplemented by materials from the United Church of Christ and American Baptist denominations. The curriculum for the demonstration and practice classes changed with each successive experiment.

Instruction periods with the teachers focused upon these elements: Identifying key concepts to be taught; devising adequate instructional objectives; basic teaching styles (inductive, deductive); reinforcement techniques;

analysis of classroom interaction; use of media. (See also ANNEX III, THE EVALUATORS' REPORT, Appendix J.)

In contrast to the workshop program, the laboratory training as developed and conducted by the Project Director, had no previous history. Both the form and the content evolved during the course of the research period. Informal evaluation procedures and interviews with the teacher participants led to frequent revisions in technique and occasional shifts in focus in the course of the training sessions. Only toward the end of the experimentation were the segments of content crystallized into a pattern that could be published and replicated.[1]

A major change in scheduling and in the pattern of training was effected between Experiment I and Experiment II. (The change, related in the paper, "A Training Design," Annex I, may have been responsible for the better performance of laboratory-trained teachers in Experiment II. See "Findings and Conclusions," below.)

2. FINDINGS AND CONCLUSIONS

Analysis of the data from the research disclosed the following findings with respect to the laboratory program:

Aggregate (all five major experiments): Laboratory teachers ranked above the controls in their competency, but not to a degree that reached the established level of statistical significance. These teachers were just slightly below the workshop group in competency.

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[1]In preparation for the National Teacher Education Project's program of Teaching Skills Institutes, initiated in 1970, the Project Director and the Technical Assistant produced a new manual based on the laboratory experiences. This 108-page booklet is in thirteen sections, and it represents a distillation of the key content of the laboratory training. Copyrighted 1970 by The Arizona Experiment, the manual is available only to persons who participate in the Institutes. (Three sections have been included in this report as Annex I.)

Experiment I: The laboratory-trained group scored significantly lower than the workshop group in teaching competency. The laboratory group was also just a shade below the control group; this difference was so minor as to suggest that the laboratory and control groups were approximately equal in competency.

Experiment II: The laboratory group ranked first among the three groups. The laboratory group showed a significantly higher level of competency than the control group, at the .05 level. They were only a little above the workshop group.

Experiment III: The laboratory group ranked first in teaching competency among the three groups. Also, in this particular experiment, the laboratory teachers attained the highest rating score means recorded for the entire research project. Even so, the differences in this Experiment III were not great enough to be regarded as statistically significant.

Experiment V: The laboratory group ranked higher in teaching competency than the control group but not significantly so. The laboratory group was a shade below the workshop group in competency.

Experiment VI: The laboratory group ranked lower than the other groups, but not significantly so in either case.[1]

In two of the five major experiments, the laboratory-trained teachers ranked first among the three treatment groups. In Experiments II, III, and V, laboratory teachers had developed greater competency than teachers who had

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[1] It will be noted from the general data in Exhibit A (page 41) that an accident occurred in the assignment of teachers to the Laboratory Group for this Experiment VI. Twenty of the 40 teachers in this experiment indicated they had received no previous training in church teaching; ten of those 20 were then assigned to the laboratory group, with only five going into the workshop group and five into the control group. It may be speculated that this uneven assignment affected the showing of the laboratory group.

experienced only the control condition, even though the difference was statistically significant at the established .05 level only in the case of Experiment II.

The experiments failed to reveal any significant differences among the laboratory-trained teachers of the four age-level groupings (Grades 1-2, 3-4, 5-6, and 7-8).

In neither of the two minor experiments (IV and VII) were the data sufficiently conclusive for generalization. (See Annex III, THE EVALUATORS' REPORT, pages 105-124.)

3. IMPLICATIONS

The findings with respect to the laboratory-trained group are encouraging indicators that this program has potential for assisting teachers to demonstrate greater competency, as measured by the 27 scales of the INSTROTEACH criterion. The laboratory teachers came very close to scoring as high as the workshop teachers who had been explicitly trained in the content of INSTROTEACH itself.

The laboratory training did include considerable attention to specific skills not measured by the INSTROTEACH scales. It is reasonable to assume that a different criterion geared to measuring more precisely their achievement in these other areas might have resulted in data showing an even greater gain than the PACE research indicated.

It is also reasonable to consider more research devoted to the accident of preponderant lack of previous training in the field of church teaching in the Laboratory Group of Experiment VI. (See page 39 [footnote].)

The laboratory teachers' willingness to teach before the video cameras, to receive the Director's critiques of their performance, and to expend the energy necessary to the total training program, were further indications (outside the purview of the research itself) that this approach to teacher training has both appeal and merit for volunteers in the churches.

EXHIBIT A
GENERAL CHARACTERISTICS OF TEACHER PARTICIPANTS IN
EXPERIMENTAL PERIODS OF PACE RESEARCH, 1968-1970

Experimental Period		Male	Female	Under Age 30	Over Age 30	0-1 Years Exp.	1-5 Years Exp.	Over 5 Years Exp.	No Prev. Trning.	Denomination
	13 L	1	12	5	8	1	4	8	5	P 9; M 3; UC 1
I	13 W	1	12	4	9	3	2	8	5	P 9; M 1; UC 3
	16 C	4	12	4	12	4	6	6	6	P 9; M 2; UC 4; E 1
	42 T	6	36	13	29	8	12	22	16	P27; M 6; UC 8; E 1
	7 L	0	7	4	3	2	1	4	2	P 6; UC 1
II	6 W	0	6	2	4	0	3	3	0	P 3; UC 1; AB 2
	8 C	0	8	2	6	3	2	3	3	P 6; M 2
	21 T	0	21	8	13	5	6	10	5	P15; UC 2; AB 2; M 2
	9 L	4	5	3	6	2	3	4	3	P 2; M 2; UC 1; D 2; E 2
III	8 W	6	2	2	6	0	4	4	3	P 3; M 1; LDS 1; AB 2; RCA 1
	8 C	4	4	3	5	1	4	3	1	P 3; UC 1; LDS 1; AB 2; RCA 1
	25 T	14	11	8	17	3	11	11	7	P 8; M 3; UC 2; D 2; E 2; LDS 2; AB 4; RCA 2
	13 L	1	12	3	10	5	4	4	5	P 5; M 3; UC 1; E 2; AB 1; RC 1
V	15 W	2	13	6	9	4	5	6	6	P 5; M 4; UC 2; D 2; E 1; AB 1
	12 C	1	11	8	4	4	6	2	7	P 4; M 3; UC 1; E 3; RC 1
	40T	4	36	17	23	13	15	12	18	P14; M10; UC 4; D 2; E 6; AB 2; RC 2
	14 L	4	10	6	8	4	6	4	10	P 7; M 2; UC 2; E 1; RC 2
VI	13 W	2	11	3	10	3	4	6	5	P 6; M 6; E 1
	13 C	1	12	4	9	2	2	9	5	P 8; M 3; UC 1; E 1
	40 T	7	33	13	27	9	12	19	20	P21; M11; UC 3; E 3; RC 2
Totals	168	31	137	59	109	38	56	74	64	P85; M32; UC19; E12; AB 8; RC 4; D 4; RCA 2; LDS 2

Abbreviations: L--Laboratory
W--Workshop
C--Controls
T--Total

Denominations: P (United Presbyterian); M (United Methodist)
UC (United Church of Christ); E (Episcopal)
D (Christian Church, Disciples)
AB (American Baptist); LDS (Latter Day Saints)
RC (Roman Catholic); RCA (Reformed Church in America)

D. Teachers' Characteristics

1. PROCEDURES

a. Collecting General Information

The teachers involved in the PACE research were all from the metropolitan area of Phoenix. They were volunteers whose schedules and personal inclinations made it possible for them to take part in the training. In every instance, they indicated a desire for training; to the Director's knowledge, none sought merely to be a part of a research venture. Their interest was captured through announcements made in churches, descriptions (oral and printed) of the training opportunities offered, and recruitment done by directors and ministers of education in congregations. The Director avoided any direct form of soliciting teacher participation.

Each teacher was asked to supply information about himself at the time he registered. Following are some general facts regarding the 168 teachers in the PACE sampling. (It was from these 168 persons that the 96 subjects in the analysis of post-treatment competency were randomly selected.)

Sex. The number of male teachers was 31; female, 137.

Age. A total of 59 were under thirty years of age; 109, over thirty.[1]

Denominations. A total of nine denominations were represented, in the following breakdown: United Presbyterian, 85; United Methodist, 32; United Church of Christ, 19; Episcopal, 12; American Baptist, 8; Christian Church (Disciples), 4; Roman Catholic, 4; Reformed Church in America, 2; Church of Jesus Christ of Latter Day Saints (Mormon), 2.

Experience. The breakdown of the teachers' experience in the church classroom was as follows: 0-1 years, 38; 1-5 years, 56; over 5 years, 74.

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[1]The exact ages of participants were not obtained. Thirty years was selected as a division point because of the then-current stress on the "communication barrier" between those under and over that age.

Previous training. A total of 64 teachers in the group (32 per cent of the total) indicated they had experienced no previous training related to their tasks as church teachers.

The random assignments of these teachers, as shown in the accompanying Exhibit A reveals a fairly even distribution of the teachers among the three treatment groups: workshop, laboratory, and control. This is particularly interesting, in that no attempt was made to take any of the foregoing factors into account in the assignment of the teachers.

An inspection of the table will indicate that Experiment II, in which both the laboratory and workshop groups were statistically at a higher level of competency than the controls, there were fewer (only five) teachers who had received no previous training.

By contrast, fifty per cent of the teachers of Experiment VI (twenty out of forty) were in this no-previous-training group. Also, it should be noted that half of the twenty (ten) were assigned to the laboratory group, with five going to the workshop and the other five into the control group. As reported below, it was in this experiment that the laboratory teachers ranked lower than the other two groups.

These facts, assembled for analysis only at the conclusion of the research project, suggest that there may be an undefined correlation between the research scores achieved by the PACE teachers and their previous training experiences.

b. Administration of Tests

A major field of research conducted during the years 1968-1970 had not been envisaged in the original PACE proposal, namely, an investigation of the profiles of those volunteer teachers who were involved in the training experiments. This area was of keen interest to the evaluators, Dr. Thomas H.

Metos and Dr. Frederick D. Levan; the Project Director assisted them in carrying out a program of testing.

Five major tests were administered to all teachers who were observed and interviewed in the course of the Project. These tests are described in Annex III, THE EVALUATORS' REPORT, Appendix I. Briefly, they were:

(1) Personality - The Structured/Objective Rorschach Test, used as a measure to investigate the question: Was personality related to church-oriented teaching competency?

(2) Mental Ability - The Henmon-Nelson Mental Ability Test (College Level), administered in order to investigate the question: Was mental ability associated with church-oriented teaching competency?

(3) Attitudes - The Minnesota Teacher Attitude Inventory, used as a means of investigating the question: Were attitudes toward teaching and toward pupils related to church-oriented teaching competency?

(4) Values - The Allport-Vernon-Lindzey Study of Values, employed for inquiry into the question: Were the values exhibited by church teachers related to competency in church teaching?

(5) Knowledge of Church Education - A specially-developed Test on Church Education, given in order to investigate the question: Was a knowledge of church education related to competency in church teaching?

At the conclusion of each of the Project's experiments, the teachers who had been observed and interviewed in order to obtain their post-experimental INSTROTEACH scores were then invited to come to the Project's headquarters to take the Henmon-Nelson Mental Ability Test, the Structured/Objective Rorschach Test, and the Test on Church Education. These were administered, in this order, by the Project Director. A typical testing period required ninety minutes.

Each tested teacher then received a stamped manila envelope in which to mail back to the Project office a completed Minnesota Teacher Attitude Inventory and a filled-in Allport-Vernon-Lindzey Study of Values booklet.

All test score sheets were then assembled for transmission to the experimenters for scoring and evaluation. Each of the above tests were computer-analyzed in relation to the teachers' individual scores on each of the 27 scales of INSTROTEACH, and their individual aggregate scores.

It had been anticipated that some of the teachers might object to the tests, or express open resentment at this additional demand for their time and energy. The fears proved ungrounded. In only two cases did teachers fail to take the tests, one on the basis of illness and the other because of a personal schedule that precluded her doing so. Several teachers expressed curiosity about their scores, especially on the Rorschach instrument, and they were referred to the evaluators for personal conferences.

2. FINDINGS AND CONCLUSIONS

a. Personality

One major finding was generated from the detailed analysis of the tests in relation to the INSTROTEACH scales: There was a sense in which personality was related to church-oriented teaching competency.

The relationship cannot be stated precisely. Inspection of the data reveals highly complex interrelationships of the factors measured in the Rorschach, as a test of personality, and the factors measured by INSTROTEACH. It might even be concluded that INSTROTEACH itself is to some degree a measure of the teacher's personality.

b. Mental Ability, Attitudes, and Values

The relationships that appeared between teaching competency and the teachers' mental ability, their attitudes toward teaching and their pupils,

and their values (as measured in the testing program) were all considered to be chance relationships.

c. Church Education

The investigations failed to reveal any relationship between teaching competency and the kind of knowledge of church education represented by the content of the Test on Church Education. It appeared that there was no justification for further work related to this test.

3. IMPLICATIONS

a. Teachers' Personalities

With respect to teacher personality, one can venture the tentative suggestion that a prospective teacher in the church might be given the Structured/Objective Rorschach test and/or other standard measures of personality as a means of getting some rough indication of how effectively he might function in the classroom (as measured by INSTROTEACH). If such preliminary testing of teachers resulted in greater job satisfaction for the church teachers, by indicating in advance their relative chances for success, it might result not only in better morale but also an improved atmosphere in the area of human interaction in the church school.

b. Mental Ability, Attitudes, and Values

The Project evaluators had expected that the findings would be inconclusive in these areas of mental ability, attitudes, and values. But the studies were still considered to have value. Enough was discovered to generalize questions for future investigations -- both within the data now on hand and in further experimentation with volunteer church teachers.

c. Church Education

To the Project Director, the finding regarding teachers' knowledge of church education was subject to the following interpretation:

Many church teacher training events in the past have focused on church-produced documents that offer a rationale for all that the teacher does. The content of these events is often predicated on the assumption that if a teacher is familiar with his denomination's general goals and objectives in education, if he has a cognitive grasp of basic pedagogical assumptions in the curriculum, and if he has an acquaintance with a body of factual data, he is more likely to teach effectively in his classroom.

Inasmuch as the Test on Church Education was designed to measure mastery of some of the content of such typical training events, it seemed significant that the testing of the PACE teachers revealed no relationship between their scores on the test and their teaching performance as measured by INSTROTEACH. (The scales of INSTROTEACH are, of course, not inconsistent with the content of previously held training events or with the content of questions in the Test on Church Education. But it bears pondering that such knowledge of factors in church education is apparently not related to what actually happens when a teacher works with students.)

E. Laboratory Student Attendance

1. PROCEDURES

An underlying assumption of PACE was that students of Grades 1-8 will attend church classes with greater regularity if there is a conscious attempt to provide a quality program of instruction. The Director took care, therefore, to maintain records of attendance of the students who were enrolled in the Learning Laboratory classes during the experimental periods.

Inasmuch as the laboratory classes were not an integral part of any church's instructional program, they were considered elective opportunities for boys and girls to receive religious education. Even so, the students who enrolled were, for the most part, boys and girls who came from active church families. Over the two-year period of the Project, the largest number of

students came from Valley United Presbyterian Church, in whose facilities the laboratory is located. But there were numerous other students from other congregations throughout the greater Phoenix area. In all, seven denominations were represented.

Recruiting of students was done at first by the Project Director, through informal telephone contacts with pastors and educational leaders in the area. Later, these contacts were maintained by a paid recruiter who relied upon the same informal techniques.

No special inducements of any kind were offered to the students to encourage their attendance. No attention was called to the fact that classes were being videotaped; and the Director did, in fact, attempt to play down the unusual aspects of the experience. Enrollment was held to six to ten students per class, chiefly in order to maintain the ideal of thirty square feet of floor space per student in the laboratory's teaching area, and also to permit better coverage of both teacher and student activity with the video cameras.

Students were advised that observers would be in the classroom at all times, but they were encouraged to consider these persons as a part of the "wall" and no more to be regarded than the brick and glass of the other walls in the room. Teachers frequently commented on the fact that students, especially in Grades 1-4, seemed generally oblivious to observers and cameras alike.

Attendance percentages, for both demonstration and practice sections of each experimental period, were calculated, in each instance, by dividing the total number of student appearances by the total number of times it would have been possible for enrolled students to attend. Enrollment was established on the basis of a student's first appearance in a class with the announced intention of becoming a member for that experimental period.

These percentages were calculated by grade level and in the aggregate for each of the seven experimental periods.

2. FINDINGS AND CONCLUSIONS

The attendance percentages are recorded in the accompanying Exhibits B-1 through B-9. Breakdowns are shown both by grade levels and by experimental periods.

For the demonstration sections, the PACE aggregate percentage of student attendance (September, 1968, through February, 1970) was 89.1.

For the practice sections, the PACE aggregate percentage of attendance was 84.2.

It will be noted, from the tables, that percentages of attendance by grade level, in the demonstration sections, range downward evenly on a descending scale from 95.2 to 84.7, with the highest percentage recorded for Grades 1-2 and the lowest for Grades 7-8.

The picture is different for the practice sections, with Grades 5-6 showing a very slight edge over the demonstration groups. The practice sections show surprising uniformity of percentages, within a range of 6.0 percentage points among the four grade level groupings.

In six of the seven experimental periods, the demonstration sections show a percentage level higher than the practice sections. The range of the differential is from 1.1 to 12.1 percentage points. In Experiment III, the practice sections' percentage was 8.7 percentage points higher than that of the demonstration sections.

Exhibit B-1

SUMMARY OF LABORATORY STUDENT ATTENDANCE BY EXPERIMENTAL PERIODS
(Aggregate percentages, all grade levels)

Experimental Period	Demonstration Sections	Practice Sections
I	94.3	82.2
II	86.2	80.5
III	81.0	89.7
IV	93.1	86.0
V	90.4	89.3
VI	78.3	77.5
VII	90.1	84.8
PACE Aggregate	89.1	84.2

Exhibit B-2

SUMMARY OF LABORATORY STUDENT ATTENDANCE BY GRADE LEVELS
(Aggregate percentages, all experimental periods)

Grade Level	Demonstration Sections	Practice Sections
1-2	95.2	84.5
3-4	89.8	83.9
5-6	86.8	87.2
7-8	84.7	81.2
PACE Aggregate	89.1	84.2

Exhibit B-3
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment I, Fall, 1968)

Grade Level	Demonstration Sections	Practice Sections
1-2	100.0	80.4
3-4	91.2	75.0
5-6	92.5	85.1
7-8	93.5	88.2
Aggregate	94.3	82.2

Exhibit B-4
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment II, Fall, 1968)

Grade Level	Demonstration Sections	Practice Sections
1-2	85.0	74.2
3-4	87.5	86.8
Aggregate	86.2	80.5

Exhibit B-5
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment III, Winter, 1969)

Grade Level	Demonstration Sections	Practice Sections
5-6	85.0	96.0
7-8	77.0	83.5
Aggregate	81.0	89.7

Exhibit B-6
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment IV, Spring, 1969)

Grade Level	Demonstration Sections	Practice Sections
1-2	100.0	87.5
3-4	85.8	92.9
5-6	93.8	100.0
7-8	92.9	63.6
Aggregate	93.1	86.0

Exhibit B-7
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment V, Fall, 1969)

Grade Level	Demonstration Sections	Practice Sections
1-2	97.5	88.6
3-4	84.4	90.0
Aggregate	90.4	89.3

Exhibit B-8
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment VI, Fall, 1969)

Grade Level	Demonstration Sections	Practice Sections
5-6	87.9	80.0
7-8	68.7	75.0
Aggregate	78.3	77.5

Exhibit B-9
LABORATORY STUDENT ATTENDANCE PERCENTAGES
(Experiment VII, Winter, 1970)

Grade Level	Demonstration Sections	Practice Sections
1-2	93.7	93.7
3-4	100.0	75.0
5-6	75.0	75.0
7-8	91.6	95.7
Aggregate	90.1	84.8

3. IMPLICATIONS

An examination of the student attendance percentage data suggests the following:

a. Attendance by students is maintained at a higher level where more skilled teachers are in charge, as in the case of the demonstration groups of PACE. In all cases these classes were taught by the Project Director and/or by other master teachers. These master teachers made a concerted effort to exhibit effective classroom procedures and to set "models" for the practice teachers.

Because the practice sessions were taught by different teaching teams each week, the students may have sensed a certain discontinuity in their relationships with the teachers. The Project Director tended to regard the element of teacher skill as the determining factor in the fairly consistent higher percentage of attendance for the demonstration groups.

b. The attendance levels achieved in the PACE classes were far above the averages reported by personnel in the churches of the Phoenix area. Unfortunately, exact corresponding data were not available. While the PACE classes were voluntary, just as all church classes, there may have been a higher level of commitment on the part of the students' families. Parents had been apprised of the importance of their children's regular attendance for the sake of the Project.

Estimates of student attendance percentages for comparable periods of time in churches from which they came ranged from 60 to 70 per cent.[1]

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[1]It should also be noted that there is evidence to support the theory that student attendance tends to be higher in classes where there is a smaller teacher-student ratio. That is, students prefer the personal attention received in small classes. Inasmuch as the PACE classes were limited in size, this factor may have been in part responsible for the good attendance levels maintained by the students.

Exhibit C

CHURCH SCHOOL ENROLLMENT FIGURES
FOR TEN PHOENIX AREA UNITED PRESBYTERIAN CHURCHES
1960 - 1969

Church	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	
A*	337	326	443	501	506	459	383	419	348	558	
B*	683	610	512	418	523	562	515	505	510	437	
C*	292	250	263	99	312	332	521	330	201	316	
D	-	84	149	105	145	164	185	203	162	108	
E	-	-	66	49	103	99	107	142	120	101	
F	-	-	-	77	137	140	150	137	125	170	
G	508	602	378	378	310	236	233	272	201	118	
H*	400	634	798	656	497	479	470	432	461	449	
I	1,100	939	790	974	751	846	1,129	1,100	863	786	
J*	218	349	413	447	375	552	628	452	425	400	
*HIGH degree of participation in PACE programs: ABCHJ	1,930	2,169	2,429	2,121	2,213	2,384	2,517	2,138	1,945	2,160	(+1.0%)
LOW degree of participation in PACE programs: DEFGI	1,608	1,625	1,383	1,583	1,446	1,485	1,804	1,854	1,471	1,283	(-30.8%)
TOTAL enrollments of all ten church schools:	3,538	3,794	3,812	3,704	3,659	3,869	4,321	3,992	3,416	3,443	(-13.8%)

NOTE: Church D was established in 1961; Church E, in 1962; Church F, in 1963.

E. Church School Enrollments

1. PROBLEM

During the calendar years of 1968 and 1969, when most of the PACE programs were being conducted in the Phoenix area, major religious denominations continued to experience declining enrollments in their church schools. The record of the United Presbyterian Church is roughly representative. Nationally, that denomination's church school enrollments dropped 13.5% over those two years:

1967	1,616,000
1968	1,517,000
1969	1,398,000

The PACE programs were posited on the assumption that the communication of our moral and religious heritage depends upon a vital ministry of teaching on the part of the churches. They were aimed specifically at the improvement of the quality of teaching in the church schools.

Experienced teachers are inclined to believe that better teaching helps both student attendance and total church school enrollments. Evaluation by Arizona State University personnel indicates that participation in PACE-type training programs has a good chance of improving measurably the competence of volunteer teachers.

Consequently, PACE determined to investigate in a preliminary way the following question: If PACE participation improves volunteer teaching in church schools, does this improvement have a measurable effect on church schools' total enrollment?

2. ANALYSIS

a. Arizona

The United Presbyterian church schools of the Synod of Arizona

experienced an overall decline in enrollment of 20.9% for the years 1968 and 1969:

Year	Total Enrollment	Percent decline from 1967
1967	9,666	
1968	8,171	15.4
1969	7,646	20.9

This is a considerably greater loss for these two years than the national average of 13.5% in the same period. It is, then, logically necessary to investigate the question: Did those church schools participating in the PACE programs lose in total enrollment as much as the rest of the Arizona church schools?

b. Participating Church Schools

A random sample of ten United Presbyterian church schools participating in the PACE programs, ranging from a high degree of participation to low or almost no participation, was drawn and enrollment data assembled. (Exhibit C, page 55.)[1]

These ten church schools had a combined drop in enrollment of 13.8% over the two years of 1968 and 1969. This is comparable to the national decline of 13.5% in the same period. It is also considerably better than the record of the non-participating United Presbyterian church schools in Arizona, which lost 25.9% of their church school enrollments in those two years:

[1]United Presbyterian church schools were used for this study because of (1) availability of data, (2) consistency of material, (3) sufficient numbers within one religious group, and (4) consistency of data from national to local levels. It has been assumed that this one group is reasonably representative of other denominations, insofar as the matters covered in this analysis are concerned.

	Participating Church Schools	Non-Participating Church Schools
1967	3,992	5,674
1968	3,416	4,755
1969	3,443	4,203

The 1969 enrollments for the participating church schools show a gain of .8%. Assuming that these participating schools had improved teaching as a result, is there a time lag for improvement in teaching to affect total enrollments?

c. Time Lag

Both groups of United Presbyterian church schools (participants in PACE programs, and non-participants) lost in their total enrollments in the first year of PACE (1968). But the participating group of churches showed a slight gain in the second year (1969), whereas the non-participating group continued to experience a decline:

	Participating	Non-participating
First year	-14.4%	-16.2%
Second year	+ .8%	-11.6%
Two years	-13.8%	-25.9%

This tabulation suggests that the effect of improved teaching began to be felt in the second year of the PACE programs. Such inference is reasonable, in that it takes time for teachers to learn, time for them to apply their learning, and further time for positive reactions on the part of church school enrollees.[1]

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[1]Data for the year 1970 was not available in time for inclusion in this study. It will be of interest to see whether or not the picture is indicative of a trend in support of the inference.

This investigation then led to the question: If there is an apparent difference between "participating" and "non-participating" churches' enrollments, what kind of differences (if any) exist between HIGH and LOW degrees of participation?

d. HIGH participators vs. LOW participators

The sample of ten United Presbyterian church schools was divided into groups of five HIGH participators and five LOW participators -- on a basis of interest, continuity, and number of teachers involved in the PACE programs of training. ("HIGH" was defined as six or more participating teachers; "LOW," as three or fewer participating teachers.) The breakdown on their enrollments is as follows:

	HIGH	LOW
1967	2,138	1,854
1968	1,945	1,471
1969	2,160	1,283

The five HIGH participators had a net gain of 1.0% for the two-year period of 1968 and 1969, versus a net loss of 30.8% for the five LOW participators.

The gain and loss percentages by years further support the inference that the effect of the PACE programs becomes apparent in enrollments in the second year:

	HIGH	LOW
First year	- 8.5%	-20.7%
Second year	+11.0%	-11.4%
Two years	+ 1.0%	-30.8%

The difference between a high degree of participation and a low degree of participation is striking in the above tabulation. But the question

must be asked: Could chance factors have caused the differences in enrollment gains and losses between church schools with a HIGH degree of participation in the PACE programs, and those with a LOW degree of participation?

e. Statistical Significance of PACE Effect on Enrollments

If degree of participation in the PACE programs is a reliable indicator of trends in church school enrollments, then it can ultimately be accepted that improvement in volunteer teaching can be expected to improve church school enrollments.

The average loss of enrollments of the ten United Presbyterian church schools in the selected sample is 13.8% for the two years of 1968 and 1969. The prediction to be tested is that the gain or loss in enrollments of the HIGH participators should be above -13.8%, and that the result for the LOW participators should be below -13.8%. Analysis of the figures revealed the following:

HIGH participators			LOW participators		
Church	Gain/Loss	+/-	Church	Gain/Loss	+/-
A	+33.1%	+	D	-46.8%	-
B	-13.5%	+	E	-28.9%	-
C	- 4.2%	+	F	+24.1%	+
H	+ 3.9%	+	G	-56.6%	-
J	-11.5%	+	I	-28.5%	-
(Aver.)	(+ 1.0%)		(Aver.)	(-30.8%)	

The critical measure in the above tabulation is that 9 of the ten total enrollment figures for the individual church schools showed trends as predicted. (Only Church F varied.)[1] Statistically, this result infers that the relation between PACE participation (and consequently improved teaching)

[1]It was learned, incidentally, that Church F moved during this two-year period so that it could be reached from residential areas without crossing a freeway.

and improvement in church school enrollment is significant at a level of approximately .01. This means that the odds are 99 out of 100 that the relation is real rather than a purely chance result. It can be accepted, with 99 per cent reliability, that improvement in volunteer teaching (as measured in the PACE research) improves the enrollment picture in those churches where teachers participate to a significant degree in training programs.

3. FINDINGS

a. It can be accepted, with approximately 99% reliability, that programs for improvement of volunteer teaching in the churches result in improvement in total church school enrollments.

b. The degree of improvement in enrollments, in this study, is indicated by a 1.0% gain among United Presbyterian church schools with a high degree of participation in the PACE programs, during a two-year period when national enrollments were dropping 13.5%, regional enrollments were dropping 20.9%, and local church schools with a low degree of participation in the PACE program were losing 30.8% of their enrollments.

c. Most of the improvement in enrollments occurred in the second year during which PACE programs could have had an effect.[1] This is reasonable, since it takes time for teachers to learn, time to apply their learning, and time for students and others to react to better teaching.

d. Nothing in these studies indicates that volunteer teaching cannot be improved by local programs initiated by a gifted clergyman, church educator, or lay teacher. However, it should be kept in mind that these findings apply

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[1] A cumulative, and larger, effect may be found in the third year (1970). Also, it might not be found. No data is currently available on the post-program effects of PACE participation.

to the PACE programs, unique in that independent evaluation by Arizona State University educators established that they actually do improve volunteer teaching.

4. CONCLUSION

A church that desires improved church school enrollment can attain it by providing programs for improving the competence of its volunteer teachers.

5. IMPLICATIONS

Many approaches are available for improvement of volunteer teaching, such as the following:

a. Sustained support for the volunteers, on the part of gifted clergymen, educators, and other lay teachers.

b. Improved techniques, equipment for teaching, and material resources available through denominational sources.

c. Wholehearted participation in proven formal programs such as those proved by PACE or its successor, the National Teacher Education Project (NTEP).

Combinations of these approaches would be altogether desirable.

But even more important is the fact that it can probably be taken for granted that any church sincerely desiring improved volunteer teaching and improved enrollments in classes can achieve both. Current trends downward in attendance at church schools can be reversed.

Both the INSTROTEACH program and the Learning Laboratory-initiated training programs are posited on the basic assumption that church education is essential not only to the continued vitality of the church itself but also to the wellbeing of the society. Built into each of the "Five Areas of Church Teacher Competence" (upon which the training programs are based) is the

underlying principle that it is both desirable and necessary to strengthen the churches' ministry of teaching -- for the communication and preservation of our heritage, for the solution of personal and social problems, and for the equipping of individuals to struggle meaningfully with today's life issues.[1]

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[1] Five Areas of Church Teacher Competence is published by The INSTROTEACH Board. It is the criterion statement from which the INSTROTEACH scales are derived. Copies of this booklet are available for purchase from The INSTROTEACH Board, P.O. Box 7041, Wichita, KS 67201, or Westminster Bookstores.

IV. OTHER PACE ACTIVITIES NOT RELATED TO RESEARCH

A. Special Workshops

By arrangement with the staff of the United Presbyterian Board of Christian Education, the PACE Director conducted nine INSTROTEACH workshops for key leaders in church education throughout the country. These were held in Overton, California; Indianapolis, Indiana; Richmond, Indiana; Sheridan, Wyoming; Chevy Chase, Maryland; Dayton, Ohio; Framingham, Massachusetts; Orlando, Florida, and Denton, Texas.[1]

The purpose of these workshops was to disseminate the INSTROTEACH concept more widely and to stimulate professionals' interest in the program. Among the more than 250 persons who participated in the nine events were 19 leaders who later enrolled in training seminars leading to certification as Assistant or Certified Directors of INSTROTEACH workshops.

B. Training Seminar

The PACE Director spent one week in March, 1969, as a consultant for a special Seminar to train 27 Assistant Directors in the INSTROTEACH program. This was the first Seminar of its kind, and the training model became a prototype for future seminars.

C. IOTA Participation

The Project Director was employed as a consultant in two IOTA workshops for public school personnel -- one in Kanaohe, Oahu, Hawaii (January, 1969), and the other in Mesa, Arizona (February, 1970).

D. Materials Development

The PACE staff produced a large number of audio-visual resources (tapes,

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[1]The tenth workshop was held in Wisconsin in April, 1971.

transparencies, photographs, filmstrips, slides) that were used in the workshop and laboratory programs. Most of these had value only in the particular settings in which the laboratory students were involved.

Two other projects, developed in collaboration with the United Presbyterian Board of Christian Education, were nationally advertised. They were tape/transparency presentations by Dr. Donald Ely, of Syracuse University, on "Objectives" and by Dr. Larry Stevens, of the Maricopa County Junior College District, on "Interaction." These latter tapes were widely employed in regional training events conducted by the United Presbyterian denomination.

E. Writing and Correspondence

In the years 1968-1970, the Director of the Project and the Technical Assistant both wrote a number of articles on their work, published in magazines and journals.

An unexpectedly heavy volume of correspondence was sustained throughout the period of the Project. Many of the letters were inquiries from throughout the country regarding the operation of the laboratory. (A large number of visitors were entertained and given full explanations of the programs and the research.) A considerable amount of the mail received was related to the national INSTROTEACH program, for which the Director served as the first Secretary-Treasurer until March 1, 1971. A shipping clerk was employed part-time to care for orders and the details of stocking, packing, and mailing the INSTROTEACH materials.

V. RECOMMENDATIONS

A. Workshop Program

1. To denominational boards and agencies in Christian education: It is recommended that INSTROTEACH workshops become a regular part of major denominational teacher training efforts. Each workshop should be offered to volunteer teachers with the following provisions:

a. That the workshop itself will be followed up by in-service laboratory programs focusing on specific teaching skills. Evidence collected in informal observations and interviews suggests that teachers who have been exposed to a workshop have gained diagnostic skill for identifying their strengths and their needs for improvement. They are also motivated toward self-improvement. But they need immediately-available opportunities for gaining counsel and guidance on how to develop their classroom skills. The long-term effect of the workshops will be enhanced if such supporting programs are correlated with the initial exposure to INSTROTEACH and its evaluative scales.

b. That wherever possible the volunteer teachers of a given church will be accompanied to the workshop by a professional (pastor, minister, director, administrator) who will share in the experience with them. Teachers find it difficult upon returning to their posts from a workshop experience to articulate just what happened. The workshops are a "process," and the effects are multiplied and reinforced if the teachers can receive support and encouragement from supervisory personnel who speak out of the same background of experience and the same frame of reference. A demonstrated value of INSTROTEACH is the fact that it supplies a common frame of reference in which to discuss the aspects of a volunteer teacher's work.

c. That workshop schedules will make greater provision for the participants themselves to suggest specific means of followup in the evaluation of teacher performance and in assessing personal training needs. When teachers are allowed to state their needs, they tend to focus on the specific skills of classroom practice; the fact that they express, in a workshop setting, a need for a given type of training increases the likelihood that they will avail themselves of it when it is supplied at a later date.

2. To educational curriculum planners in colleges, universities, and seminaries: It is recommended that INSTROTEACH workshops should be offered as a part of the regular curriculum of institutions of higher education, especially theological seminaries, for the purpose of developing more graduates who can be effective "teachers of teachers" at the local level. Continuing education departments and centers at colleges and universities should consider periodic offerings of INSTROTEACH workshops.

It is the graduates of such institutions that are the logical source of personnel for conducting future training events for volunteer and professional teachers. All too frequently they confess to a lack of background in the kind of basic insights into the work of the teacher that are provided by INSTROTEACH.

B. Laboratory Program

1. To the Board of Directors of the Arizona Experiment and to similar governing groups for other centers of experimentation in church education: It is recommended that the Clara B. Worthington Learning Laboratory continue its operation for the purpose of generating new concepts, techniques, and materials for the training of volunteer church teachers. Consideration

should be given to the following:[1]

a. Development of training blocks or modules that will focus on specific teaching skills and be offered repeatedly so that volunteer teachers may attend them in any sequence, as time is available. Each block should employ demonstration and practice teaching with boys and girls so that the principle of unity between theory and practice may be preserved.

b. Development of additional training directors who can extend the laboratory-type training to more teachers on the local scenes. The directors' duties and specific abilities can be defined from the prototype established in the PACE laboratory program.

c. Additional research on the degree of change occurring in teachers exposed to the laboratory training. The research on the laboratory techniques calls for development of new criterion instruments designed to measure more precisely the performance of teachers after they have been exposed to the laboratory program's content.

d. Additional research of the type employed in PACE, to provide for a group of teachers who had been exposed, in sequence, to both INSTROTEACH and laboratory training.

e. Development of criteria to establish levels of need and readiness for specific types of teacher training, in order to provide for more effective matching of individual teachers with those types of training that will be most helpful at a given time in their tenure of service.

f. Use of the laboratory setting for testing students in such areas of education as: Concept development (in order to determine which concepts

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[1]Items a. and b. (below) are already in effect, with the planned Training Blocks to be offered repeatedly at the laboratory for teachers in the Phoenix area, and through the training offered in Teaching Skills Institutes. Summer programs and other training ventures around the country in the years 1970-1972 will focus upon development of new teacher educators.

should be introduced at which age levels, and in what sequence); reactions to electronic media (to measure the effects of these over against the more traditional types of curricular materials used in typical churches); interaction and human dynamics in the church-oriented teaching situation (in order to identify key problems to be overcome in these areas by a teacher working in a typical church setting).

g. Development of mobile laboratories to be itinerated regionally for the purpose of offering more such training to a greater number of teachers, near their own classrooms.

h. Development of a continuing relationship with consultants in higher education institutions, for the purpose of interrelating the laboratory program with current research and activities in other fields of education.

C. Teacher Characteristics

1. To researchers in the field of church education: It is recommended that further, more detailed analysis of the PACE data should be undertaken with respect to given teachers and their test scores, to determine whether there may be research "leads" for future investigations.

2. To researchers: It is recommended that the Structured/Objective form of the Rorschach Test (the personality test used in PACE) should be administered to a larger sample of teachers in another research project, to determine whether the findings of previous research (on its interrelatedness with the INSTROTEACH scales) may be sharpened and defined.

D. Student Attendance

1. To researchers and statisticians in the field of church education: It is recommended that further attention be given by churches to statistical comparisons of attendance at classes taught by INSTROTEACH workshop- and laboratory-trained teachers, in contrast to those classes taught by teachers who have not been exposed to these programs.

Should there be a significant trend in favor of larger, more consistent participation in the classes of teachers who have had the workshops or the laboratory training, then the further recommendation is obvious: that more teachers be encouraged to receive the offerings of both programs.

2. To researchers: It is recommended that more careful research be undertaken as to the factors motivating students to attend church classes. The key questions to be explored are: What are the main reasons (in the students' minds) for consistent attendance at church classes? What would cause students not to attend consistently?

If such research should reveal that students are motivated by teachers who demonstrate the kinds of skills stressed in INSTROTEACH and the laboratory training, then the case is strengthened for continuing and expanding these forms of training.

E. Church School Enrollment

1. To researchers: Attention should be given to the relationship between total church school enrollments and the participation of teachers (in significant numbers) in training programs of the type employed in PACE. Such research should also include a study of the possible time lag between improved teaching and increased total enrollments. Since it was demonstrated reliably in the Phoenix area that high participation in effective training programs on the part of teachers increased student enrollment, the case is further strengthened for expanding such programs as those developed in PACE.

F. Local Program Planning

1. To members of local governing groups in churches (judicatories, boards, councils, vestries, consistories, etc.): It is recommended that employed personnel who are responsible for program planning and education in congregations and parishes (clergy and other professionals) should focus

their attention on adequate support and training for volunteer teachers. Wherever possible, they should acquire the necessary skills in order to train teachers adequately.

2. To clergy and key laymen involved in teacher education: It is recommended that INSTROTEACH workshops and laboratory-type training be employed on a wide scale for as many local teachers as possible. Significant numbers of teachers should be exposed to both types of programs so that each may serve to reinforce the emphases of the other. Since INSTROTEACH workshops are diagnostic and motivational, the teachers should have ready access to additional training that will enhance their particular skills in the classroom. Laboratory training focuses in detail on these essentials.

3. To all program planners in churches (clergy and other professionals, key laymen): It is recommended that both enrollment and attendance figures in church classes be measured in relation to the degree of training provided for the teachers. (PACE research implies that both enrollment and attendance trends will be improved when larger numbers of teachers receive more adequate training for their tasks.)

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S1

ANNEX I

ARTICLES BY PROJECT DIRECTOR AND TECHNICAL ASSISTANT

DESCRIBING TRAINING DESIGN AND INDICATING STRESS

PLACED UPON MEDIA AND LABORATORY ENVIRONMENT

82

A TRAINING DESIGN

by

Locke E. Bowman, Jr.

The training design for volunteer teachers, as developed in our 1968-1970 Project for the Advancement of Church Education (PACE) Learning Laboratory, at Scottsdale, Arizona, proved to be an effective way of assisting church teachers to improve in their classroom practice. The research indicated that a considerable number of these teachers demonstrated a level of competence superior to that of teachers in the control group (who had not received any kind of additional training), when observed back in their own classrooms.

Several underlying principles or assumptions lay behind the design as we worked it out:

1. Every training experience should be directly related to experience with students in actual classroom situations (either real or simulated). Too much of teacher education in the past has been a series of sessions in which we "talk about teaching" but don't actually do it. In our opinion, the teacher finds it difficult if not impossible in many cases to translate these discussions, however enjoyable, into his classroom practice. And when he does try to do so, he finds himself wishing he could return and take the training over again -- either to find out why things worked as they did, or why they failed to do so.

2. Every teacher must have an opportunity to observe some kind of "model" for effective church teaching. It is so often said that teachers "teach as they were taught" in their childhood and youth. This is a way of saying that their own teachers have served as models through the years. Training experiences, therefore, should provide new models. The expression "master teacher" is probably a misnomer. There is no such thing as a teacher who has mastered all the skills. Every teacher can become a better teacher, and we are all involved in self-evaluation and self-improvement. But teachers who demonstrate special strengths can be identified, and it is they who should be singled out to serve as the models.

3. Every teacher needs the chance to succeed. A training experience should include in its design some periods of practice in which the teachers may try out suggested or modeled techniques and proceed at once to evaluate them. If at all possible, they should have a chance to try once again in case of difficulty or "failure."

4. It is essential, in a good training experience for teachers, that there be time to analyze and discuss what has transpired in demonstration and practice sessions. This analysis is best done under the direction of a specialist who can intersperse the discussions with a certain amount of instruction in basic teaching skills.

With these principles in mind, we set out to establish our Learning Laboratory. We began with a bare classroom in the Valley Presbyterian Church, Scottsdale. Our first step was to develop this area into the most attractive learning environment we could afford on our limited budget. We carpeted the floor,

purchased trapezoidal tables adjustable to varying heights, obtained chairs for the different age levels, installed chalkboard and bulletin boards, and outfitted a large walk-in closet as our storage space and media center.

We installed nearly $14,000 worth of videotape recording equipment: cameras and microphones, recorder, screen-splitter, microphone mixer, and remote control unit. (The cameraman is never in the classroom; he operates from monitors at a console in our office space which is in another part of the building. Students and teachers were not camera-conscious.)

In our closet, we kept all the items described by Donn P. McGuirk in Section K, "Media for Teaching," in this NTEP Manual. See also Section L, "The Teaching Environment."

FIRST SCHEDULE

Our first schedule for training involved twelve two-hour sessions for each teacher, as follows:

On six weekday afternoons, four to six teachers of a given grade level would come to the Laboratory and observe two separate groups of children being taught a segment of material in 50-minute periods. (The teachers arrived at 4:00 p.m., and the students came at 4:10. The teachers observed throughout the hour until 5:00 p.m., at which time they took a ten-minute break. Then, at 5:10 p.m., a second group of children arrived and the teachers observed another demonstration of that same segment.)

The teachers returned on Saturday, at which time a team from the group would teach a third group of youngsters the same material. We would then play back videotaped segments of all three class sessions -- the two from earlier in the week and that of the practice session just ended.

This design proved impractical for three reasons:

1. The boys and girls were tired out when they got to us on the weekday afternoons. They were irritable and listless. We concluded it was nothing we were doing, just the wrong time of day.

2. There was not enough time for the director to lead discussions with the teachers.

3. The teachers sensed the need for more time to view and analyze the videotapes.

FINAL SCHEDULE

Working with one age level at a time, we moved into a new format, as illustrated in Fig. 1. This proved not only workable but highly satisfactory to all our teachers. It involved approximately the same number of teachers and hours but was a far more efficient way to use our time and that of the students.

This new format required nine sessions with the teachers -- five on Saturdays (three hours each) and four on weekday evenings (two to three hours each).

We conducted all demonstration and practice classes on Saturdays only. The students came fresh and relaxed, and their morale was high. We had virtually none of the problems we encountered in the earlier design.

Following is a narrative description of the nine sessions, in order:

Saturday 1: An orientation to the laboratory procedure and to the training course (1 hour). A study of how to prepare instructional objectives (See Sec. E) and plan a study session (1 hour). FIRST DEMONSTRATION, with the Director and another experienced teacher teaching a group of students the first session in a four-session unit. (This group of children came each Saturday at this same hour for four Saturdays; they were called our "demonstration class," and they received one full unit of instruction.) We used Observation Form A.

Weekday evening 1: Teachers returned to the Laboratory to view and analyze in detail the videotape from the preceding Saturday's first demonstration. The Director introduced a study of the nature of concepts; the group discussed concept development. (See Section C.) A team of two from the group were selected to remain a bit longer and plan for the FIRST PRACTICE session at which they would be the teaching team.

Saturday 2: FIRST PRACTICE session, with teachers repeating that segment of instruction they had observed in the first demonstration a week earlier (live) and on the videotape during the preceding weekday evening. A second group of children whom we called our "practice class" for the four Saturdays on which they came, were thus beginning the first of their four-session unit. During the second hour, we viewed and discussed segments of the videotape recording of what the teachers had just completed. The Director made use of Form A and of the material on concepts in leading this analysis. At the third hour, the teachers viewed the SECOND DEMONSTRATION, using Observation Form C.

Weekday evening 2: Teachers viewed and analyzed the videotape recording (VTR) from the second demonstration. The Director then led a discussion on reinforcement theory and methods of reinforcement in class sessions. (See Section I.) A teaching team was selected to plan for the SECOND PRACTICE session the following Saturday.

Saturday 3: SECOND PRACTICE session, a repetition of the second demonstration, with the teaching team having the benefit of both a live and a taped observation in the week preceding. The VTR was viewed and discussed, with teachers focusing upon the reinforcement skills of the practice teachers. This was followed by the THIRD DEMONSTRATION; teachers used Observation Form B.

Weekday evening 3: The Director introduced the Media Specialist for a presentation and discussion on the use of media and on the teaching environment. (See Sections K and L.) This was always a popular evening, with many questions asked.

The VTR of the third demonstration was then shown and analyzed (using Observation Form E), with teachers also looking for examples of reinforcement and varying patterns of interaction (verbal and non-verbal) in the observed segment. A team was selected to prepare for the THIRD PRACTICE.

Saturday 4: THIRD PRACTICE, followed by VTR and discussion. The Director focused on interaction in leading this analysis. The FOURTH DEMONSTRATION took place in the final hour, with this group of students being dismissed at the conclusion of this unit of study. Teachers used Observation Form D.

Weekday evening 4: The Director gave his "million dollar lecture" on teaching styles (See Section F), and led a discussion on inductive and deductive logic in the teaching situation. The group then viewed and analyzed, from that point of view, the VTR of the fourth demonstration. A teaching team was selected to do the final practice session on the fifth Saturday.

Saturday 5: FOURTH PRACTICE, this being the final session for these boys and girls. Viewing of the VTR, with Director leading the analysis in terms of induction and deduction. The Director then led a concluding one-hour review of all the segments in the training design; this hour included an evaluation period and the presentation of training certificates.

COMMENTS ON THE DESICN

We chose the 50-60 minute demonstration sessions rather than the micro-teaching approach because we felt that church teachers needed very much to see how an hour of instruction time could be effectively used. They needed to know how to plan and execute such an hour, from beginning to end.

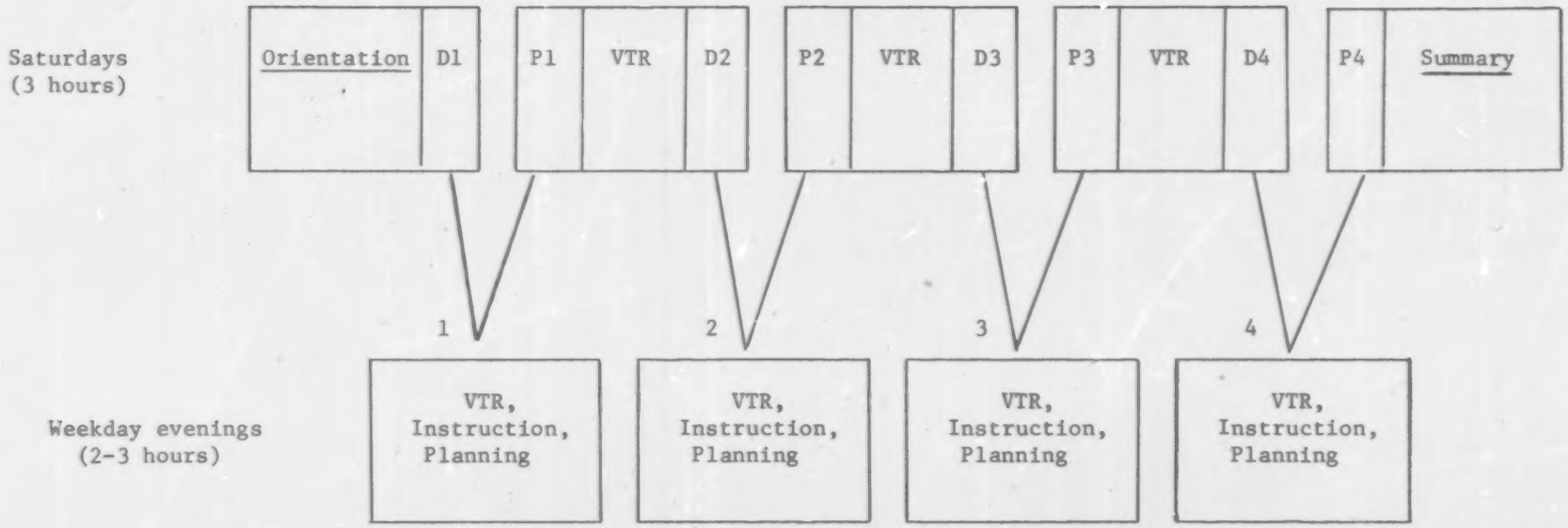
Later, we could see the value of microteaching as an addendum to the program. There were some specific skills that the teachers needed to work on; the longer practice periods did not afford them enough time to do so. Consequently, in our final research period we substituted microteaching for the full-length teaching period in the fourth demonstration. The teachers were grateful for this and said they would have liked more of it.

Many public school persons expressed great surprise that our teachers would "allow" themselves to be videotaped; they indicated that, in their experience, teachers had been reluctant to do so. Not once, though, did we encounter any resistance. In general, our teachers seemed to react positively to the experience. It was as if they were thinking, "Well, I really look better than I thought I did. I'm not such a bad teacher after all!"

The Director, in his periods of analysis following each VTR taping, was careful to offer support and encouragement in good measure. Every teacher showed some strengths in considerable measure, and we could point this out at the beginning. More often than not, teachers were much harder on themselves -- more critical, than he (the Director) would have dared to be. Quite frequently the teachers took the lead and suggested their own needs for improvement.

Figure 1

LEARNING LABORATORY SCHEDULE



D - Demonstration Class
P - Practice Class
VTR - Videotape Recording

From the outset it was our intention to develop the kind of setting in which we could do two things: (1) Demonstrate effective teaching in 50-60 minute time blocks, with grade levels 1-2, 3-4, 5-6, 7-8; (2) demonstrate the use of some of the newer media in church education.

TRANSLATION TO THE LOCAL SCENE

The basic element of this design could be summarized: Observe to learn; talk it over; practice to learn; talk it over. While the videotape recorder makes it possible to add a new dimension to this kind of experience, we do not believe it is absolutely essential. Any church's teacher education venture could be structured to provide the same essential elements without benefit of the video.

It has occurred to us that a church with two hours of church school (in separate one-hour segments) could develop such a design on successive weeks of the regular class time. School I (say, at 11:00 a.m.) could begin a four-week unit with its students at a given point in the calendar. This would become the demonstration group that would continue weekly as an observation setting for teachers in training. School II (say, at 9:30 a.m.) would begin a week later with that same four-week unit, this group being the practice group and taught by teachers-in-training. All the other elements would remain the same, with a Director serving as the catalyst and providing analysis and instruction on weekday evenings or at some time suitable to trainees. This pattern could be followed repeatedly within the year.

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THE TEACHING ENVIRONMENT

by

Donn P. McGuirk

Have you ever entered a church classroom, bent down to the height of the students as you passed through the door, and looked closely at your surroundings? Try it sometime. Pretend you are a student, and ask yourself these questions:

Does this room invite me in?

Does it say to me, "Come in, we'll have a good time and learn something new today?"

Is it clean and neat?

Is it colorful?

Are the pictures, displays, and bulletin boards placed according to my height? (Or did the teacher do it all?)

If any of your answers are in the negative, then some changes are in order.

Frequently, a classroom becomes so familiar we don't even see it. The paint, assuming it ever had any color, fades; the walls get dirty; papers, outdated materials, and a general assortment of junk begin to collect in the room. Bulletin boards prepared for Christmastide are still seen as Easter approaches, or perhaps it would be more accurate to say, they are still there but no longer seen.

In other words, the room is dull and lifeless. It does nothing to excite the student or to prepare him for what might well be a very satisfying experience of learning.

What are some of the ways in which such a classroom can be changed into an interesting, cheerful, and friendly room for learning?

There is nothing like a new coat of paint to lift the face of the classroom, plus the spirits of both the students and the teacher.

Can you afford carpeting? This is a worthwhile investment in that it not only improves the appearance of the room and helps to minimize noise but also provides a place for younger students to sit at least during part of the class session. If carpets are out of the question, rubber feet on the chairs, a few rugs (that will not slip), drapes, and another bulletin board will help cut some of the noise.

While we are talking about bulletin boards, here are a few general rules that should be observed:

1. Make them interesting.

Remember, your students are exposed to millions of dollars' worth of display and promotional materials each day through television, advertising signs, and magazine ads. They no longer settle for poor quality displays. Make your bulletin board something special. Take advantage of the examples of colors and designs you see in magazine ads. Use magazine pictures that are appropriate for your display. This is one of the most inexpensive teaching aids available.

2. Make them colorful.

Colored pictures, pictures mounted on colorful backgrounds, colored borders, colored cut-out letters, and designs in color are all ways to make your bulletin board attractive and eye-catching. Colored yarn or construction paper directing your eye from one part of the message to the next is another.

Don't overdo color just to make your bulletin board loud -- use your best judgment. A good way to preview your display before putting it up is to lay it out on a large table or on the floor. In this way you can see what changes, if any, should be made.

3. Keep them simple.

Don't use so many pictures, or so much printing, that the entire board becomes a tangle of confusion and the message is lost. Use only what is necessary to stimulate the viewers. The main function of the bulletin board is to create interest in the subject, not to tell the entire story.

4. Make them unusual.

Students today have seen so much on television that they are no longer as interested in the everyday things; therefore, if your bulletin board can contain an unusual picture, design, or color combination, it will be noticed much more readily.

5. Change them frequently.

A board that is changed with a fair degree of regularity, before it becomes stale, will have a stimulating effect on the students. They will enter the room anticipating something new! They will feel that the teacher is interested in them! They will not have the feeling that this will be a monotonous class session.

Humor, too, has a place in your bulletin boards; but care must be taken that it is used to amplify the message or to help build a more relaxed atmosphere, and does not destroy the value of the display.

For small children, materials on the display or bulletin board should be as near to their eye level as possible. Remember, you have already seen the display. Now give your students a chance.

Pictures are much more attractive and effective when mounted on a piece of poster board or tag board, to provide a border and some rigidity before securing them on the bulletin board. If the pictures are good enough to mount, they are good enough to save for another possible use. Therefore, no pinholes should be put in them. If straight pins are placed in the bulletin board around the edges of the tag board mount and slanted toward the center of the picture, five or six pins are all that is needed to hold it in place. In this way your mounted picture can be used over and over without being damaged by pinholes.

An attractive and inexpensive way of providing interesting and colorful bulletin boards in the lower age classrooms may be provided through the use of Celotex and colored burlap. One full-size sheet of Celotex may be cut into a variety of interesting smaller shapes (squares, circles, triangles, free form, etc.), covered with different colors of burlap, and mounted at various places in the classroom (keeping in mind the height of the students). The variety of shapes and colors improves not only the appearance and acoustics of the room but also encourages the students to make their own displays.

Two other types of boards now coming into use in the classroom are the Hook-'N-Loop board and the Faber-Board.

The Hook-'N-Loop board is a heavy material made up of thousands of tiny loops of thread, and mounted by various means on the wall. Strips of tiny, plastic hooks (like those on a cocklebur) are secured on the back of the item to be mounted. The item can then be placed on the board and removed as

frequently as desired. The big advantage of the Hook-'N-Loop board is that 3-dimensional materials and displays may be placed on it in seconds. (Light-weight pictures and charts can be held on the board with loops of masking tape.) You might call this a modern flannel board.

The Faber-Board is a multi-purpose visual aid panel. It is white in color and is used in place of a chalkboard. Special felt pens in a variety of colors are used to write or draw on the board, and can be wiped clean with a damp cloth. The combination of the white (but not glaring) background, and the attractive colors of the ink, help greatly in creating and sustaining student interest.

The Faber-Board can also be used as a projection screen, as well as a magnetic board. Strips of plastic magnets may be adhered to the backs of pictures, cards, charts, etc., and used to present concepts sequentially.

Attractive lettering for bulletin boards, posters, and displays is frequently the downfall of many church teachers. Yet it need not be. For each person who is able to produce attractive hand lettering using a felt pen, there are a thousand who can produce beautiful, professional looking printing by using one of the mechanical printing aids available.

Two of the better known printing aids are the Wrico which consists of a plastic stencil, stencil holder, and special pen, and the Leroy which is a stylus and template combination. Both use drawing ink and do a beautiful job. They are available in many blueprint supply houses.

A less expensive, but equally attractive, method of lettering the bulletin board is to use pre-cut letters. These are letters cut from colored construction paper and are available in a variety of sizes in both upper and lower cases. They can be pinned on the board and used many times. These can be purchased from art and school supply houses.

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An interesting innovation in bulletin board lettering is the use of magnetic letters. To do this it is necessary to mount a piece of lightweight galvanized iron on the bulletin board. (This can be purchased from a heating and cooling company that will also cut it to size.) If you are fortunate enough to have a Hook-'N-Loop board, all that is needed to hold it to the board is the hook material of the back of the metal. Otherwise, "T" headed pins around the edge of the metal will hold it on a standard bulletin board. The galvanized sheet should be painted a neutral color (gray is most practical) to blend with a variety of color combinations. You may either paint it yourself with a can of spray enamel, or have an auto paint company put a more durable finish on it.

Magnetic-backed plastic letters are available at most school supply houses and some art supply stores.

The color of the metal may be varied by using lightweight, colored paper between the metal and the magnetic letters. It is not necessary to adhere the paper to the metal, as the magnetic letters will hold it in place. The paper must not be too thick and the metal must be either iron or steel to be attracted by the magnets.

The arrangements of the chairs, tables, interest centers, etc., should be changed from time to time, to add a sense of variety in the classroom. Chairs and tables should be appropriate to the size of the students.

When any instructional equipment (filmstrip projector, tape recorder, etc.) is to be used, the teacher should have it completely set up, adjusted, and ready for immediate operation before the class session begins. Nothing destroys the mood set by the teacher in preparing for a presentation any more quickly than having to fuss with the equipment at the last minute.

Physical comfort in the classroom is very important if learning is to take place. A room that is too hot, too cold, too sunny, or too windy does not allow the students to concentrate. They are distracted by their discomfort. Be aware of this fact at all times and keep the room as comfortable as possible.

Finally, encourage the students to take a part in the planning and arranging of the room, the bulletin boards, and displays. Let them personally be able to share in the pride, along with you, in having an attractive and efficient classroom.

If you will keep two rules in mind, your enjoyment of teaching as well as the students' enjoyment of learning will be greatly increased:

1. Keep an attractive classroom.
2. Have it prepared beforehand.

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MEDIA FOR TEACHING

by

Donn P. McGuirk

Whether you call them audio-visuals, instructional aids, media, or just "teaching gimmicks" is relatively unimportant. Whether or not you use them is!

Why?
Students of all ages are now being exposed to various forms of instructional aids in public school classrooms. They find these aids to be an interesting if not exciting way of learning. For students then to come to a church classroom where few if any media are used, and where teachers spend considerable time lecturing, certainly does not promote their desire to learn.

Instructional aids can be used to stimulate and hold interest, reinforce concepts, review, or simply break the routine.

When?
Instructional aids should be used whenever they will help the learner to understand better a specific concept or area of learning.

They may be used when students first arrive, either for review of previous sessions, or in preparation for the present study. They may also be used at the end of a period of study for a review of the key discoveries.

One important thing to remember: Do not overdo the use of any one medium. This becomes boring and can do as much harm as good.

What?
Know your class and the subject matter. Then use whatever will most ideally present information, ideas, and questions in a manner most easily assimilated by the learner -- depending, of course, on the materials and equipment available.

Where?
It is far more practical to bring all equipment into the classroom than to take the class to an audio-visual room, no matter how beautifully designed the room may be.

You will find that there is a much freer flow of interaction among students and teachers when the media are used in a familiar classroom. It is also very important for teachers to know how to operate all equipment. Just as soon as another person is brought into the room to operate a projector the students tend to become more self-conscious; this limits their participation in discussion.

How?
Be familiar with all equipment that is available to you. Have its use demonstrated by someone who thoroughly understands it. This can either be someone from your own church, or an expert from elsewhere.

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Learn not only the operation of the equipment, but also how to make minor repairs (change bulbs and belts, clean the lenses, etc.). Learn well enough so that you will be able to teach others.

It is wasteful to have expensive equipment sitting idle because no one knows how to operate it. This happens all too frequently.

Be selective in choosing a piece of material. Be critical! Make sure it will do the job you need it for! Do not use it just because it happens to be available, or free. Have a legitimate reason for using it.

Always preview materials, introduce them properly, then follow them up with a discussion or review of some kind. Get your full money's worth from rented material.

Let's look at some of the pieces of equipment individually.

Record Player

The record player is one of the most easily obtained teaching aids. It is also one of the easiest to operate. (Automatic record players are not recommended for classroom use.) And it is one of the most often abused items. (Arm dropped, needle worn, dust build-up around needle, cartridge damaged due to heat, etc.)

The record player can be used to set a mood, as background music for a play, to accompany singing, to provide the narration for a filmstrip, or to study recorded music, drama, speech, and documentaries.

Tape Recorder

Two types of tape recorders are available. The "reel to reel" recorder has been with us for years and is frequently used in the classroom. More recently the cassette has taken over as the most popular recorder. There are many advantages to be found in the cassette recorder: It is much simpler to operate as there is no threading of tape; you just insert a self-contained cassette of tape into the machine. There is less chance of tape damage, and the recorder is smaller, lighter, and less expensive than the "reel to reel" unit.

The audio tape recorder can do everything that a record player can, plus recording such activities as interviews both in and outside the class, television and radio broadcasts for later listening and discussion, plays and role-playing.

Frequently teachers will re-record the sound track of a filmstrip from a record onto tape. In this way the tape and filmstrip may be stopped to allow discussion on a particular frame. The tape can then be restarted at the proper place, a very difficult operation on a disc recording (unless you have a "pause control" device).

Filmstrip Projector

This is also a very common piece of teaching equipment, and while familiar to the average teacher, it is not used as frequently as it might be.

Thousands of filmstrips are available on hundreds of subjects, some good, some poor (see section on AVRG for help in choosing films and filmstrips).

The filmstrip projector is easy to thread and easy to operate, and ranges in price from $35.00 for a table top model, to as high as $300.00 or so for an automatic projector with record player.

When using filmstrips it is well to keep in mind the fact that it is not practical to take up class time showing the entire strip if one or a few frames will serve to spark discussion or reinforce a concept.

One method of getting efficient use from a filmstrip is to assign areas of the strip to teams of two students. Have them watch for specific happenings in the story and be prepared to report on them. The advantage in having two on a team is that the second person can report on something the first student may have missed. By the time the entire group has reported on sections of the strip, the class has not only had a second exposure to it, but has verbally commented on it, which helps to reinforce their retention of the material. If time permits, show it again and discuss it.

Having the students write their own script to a filmstrip is another interesting use of the material.

Try to buy filmstrips that can be used several times for several groups. Remember -- even though the script of a particular filmstrip is written for a certain age group, it is possible to rewrite the script for other age levels.

Slide Projector

These are available in hand operated models, remote controlled, automatic, and audio tape activated units. One advantage the slides have over the filmstrips, is that they may be edited and rearranged, whereas the sequence of frames in a filmstrip is fixed.

Using a camera, slide projector and tape recorder, students can write, photograph and record their own production (an excellent way to bring parents into the scene, too).

If a particular mood is desired, try projecting an appropriate slide on a large screen, with suitable music in the background.

Motion Picture Projector

The projector most commonly used in the church classroom is the 16 mm. sound projector. The reason for this is that very little filmed material is available for other type motion picture projectors.

The standard 8 mm. format (the typical home movie) is rapidly being replaced by the super-8 camera and projector, and until recently no one was

producing church related films in this size. Now, however, since a wide variety of super-8 projectors, including the new cartridge type which needs no threading, and both magnetic and optical sound on film units, a few producers are showing an interest in church-related super-8 mm. films.

While 16 mm. films are fairly expensive to rent, they are very useful in many areas. They are excellent discussion starters, useful for exploring concepts, and studying other countries, cultures, and eras.

Opaque Projector

This projector is useful to project pages in a book, pictures in a magazine, and most material printed or drawn on an opaque surface.

The disadvantages of using the opaque projector are that it is quite expensive, bulky, inconvenient to transport, and it is necessary to have the room quite dark.

Overhead Projector

The overhead projector is one of the most useful and versatile pieces of teaching equipment available today. It can take the place of a chalkboard, and is used by sitting beside it and facing the class.

Material for an entire session can be prepared ahead of time on as many sheets of acetate as are necessary. Special pens and pencils, both permanent and water soluble, are available in many different colors.

The overhead projector can be used in a brightly lighted classroom, and can be projected on a light colored wall.

The transparencies (sheets of acetate that have been prepared and are ready to project) may be hand drawn or printed. Maps, drawings, symbols, etc., can be easily copied by laying a sheet of clear acetate over the picture and tracing it. An entire sequence may be shown by having a number of items on one sheet and gradually exposing one at a time by sliding a piece of cardboard off the transparency a bit at a time.

A more impressive transparency may be designed by using overlays. These are additional sheets of acetate that are hinged on the side of the main transparency. As the story is told, appropriate sheets of acetate are added to the main transparency, completing the chart or picture a little at a time. To make the transparency more rigid, it is mounted on a cardboard frame.

Printed matter from newspapers and magazines may be copied by using specially treated acetate and running it through a thermal copying machine.

Clay base magazine pictures in color can be made into transparencies by applying an adhesive backed acetate to the face of the picture, soaking it in water and actually lifting the ink from the paper.

The overhead projector is not a terribly expensive piece of equipment considering all that it will do. Prices start at around $140.00.

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Screens

Four types of screens are in common use in the classrooms. The matte screen is excellent in a room that can be darkened. This type screen allows viewers sitting at the sides of the room to see almost as bright a picture as those in the center of the room. The beaded screen reflects more light than the matte screen, but the brilliance drops off the farther you sit from the center of the screen. The lenticular or daylight screen is good for rooms that cannot be too well darkened. Tiny vertical grooves in the screen reflect the outside light at an angle while reflecting the light from the projector back to the audience. The fourth type screen is the rear projection screen. A piece of translucent glass or plastic is mounted in a frame. The beam from the projector is reflected from a mirror (to correct the reversed image) onto the back of the screen. The audience in front sees a bright picture, even in a lighted room, since they are seeing more of the light, not just a reflected light.

Another advantage to the rear projection screen is that the students may come directly in front of the screen to examine or point to something, and not cast a shadow or interfere with the picture.

Headsets

Headsets, whether in the form of a listening center (connected by wires) or the new wireless units, are a wonderful means of providing individual study or enabling research while the rest of the class members are involved in other activity.

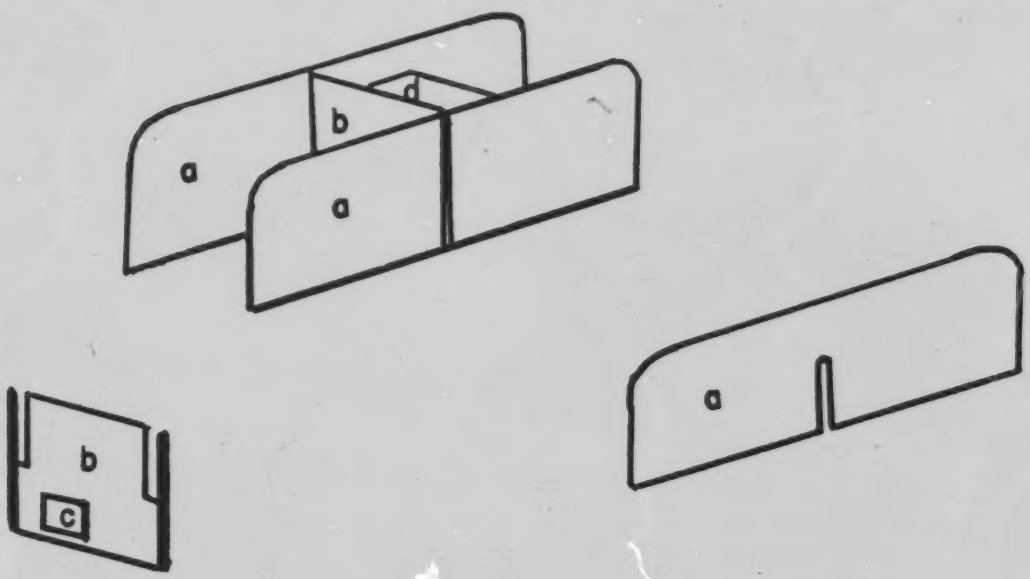
The use of headsets for individual learning has several advantages. Since the listener is reasonably free from distractions, he is better able to concentrate on the material. Also, difficult concepts (particularly for the poor reader) are more easily understood when the information is given verbally.

Study Carrel

The study carrel, like the headset, is used for individual study or research. The student, because his view is blocked from the front and sides, is free from any visual distractions in the room. He is able to devote his full attention to the assignment. The headset is frequently used with the carrel which then removes practically all distraction.

Most study carrels are equipped with small screens so that the student may use projected materials right in the carrel.

Below is a drawing of a very practical carrel. It will accommodate two students and sits on top of a classroom table. The unit may be completely dismantled for storage.



The slots in the two sides "a" fit into the two slots in "b." A shelf, "d" rests on brackets on either side of "b" to give more rigidity to the carrel. "C" is a small projection screen. The carrel sits on top of a table, or two trapezoidal tables together (adjustable in height).

Videotape Recorder

If your church is fortunate enough to own, or have access to, a videotape recorder and camera, it can benefit both the teachers and students. It can be used to record a live classroom session and be played back for self-evaluation of the teacher. The students may use it for a special production, role-playing, or a pre-recorded presentation by a special resource person.

Many brands, types, and prices of recorders, cameras and other video equipment are available. The unit a church would buy would have to depend on the need and the budget.

Individual Learning Aids

These aids stimulate a desire on the part of the learner to test his own knowledge. Many types are available, from an electric testing board, that indicates with a light or bell when the proper answer is selected, to the new "Study Scope."[1] The Study Scope is a plastic cylinder about ten inches long with a viewing window on each side. A question appears in one window and the answer appears in the window on the opposite side. By turning the knobs at the ends of the cylinder, ten different questions and answers are exposed. The questions and answers are written on a sheet of paper that is inserted in the cylinder.

Many other simple test and review games may be devised by the teacher.

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[1]Available from: Study Scope, 319 E. Front Street, Tyler, Texas 75701.

Speaker Phone or Conference Phone

This is a device that enables an entire class to hear and participate in a telephone conversation. The loudspeaker amplifies the incoming voice, and a microphone will pick up anyone speaking in the room.

With this unit it is possible to call someone anywhere in the country (an Old Testament expert perhaps, or a government official) and have him speak with the class and answer their questions.

The speaker phone can be connected to your present phone by the telephone company.

Media Centers

Some suggestions for setting up a media center in a church may be of value.

1. Get your teachers excited enough to interest those who hold the purse strings.

   a. By demonstrating to the teachers how to use the equipment you do have.

   b. By previewing the materials available at teachers' meetings.

   c. By demonstrating how the use of instructional aids will increase the teachers' efficiency as well as create and hold student interest.

2. Get a budget established for media.

3. Work closely with the teachers and make suggestions for the use of materials that would help achieve teaching objectives.

4. Prepare and give to each teacher a catalog listing all equipment and materials available for use. Describe the filmstrips, slides, records, etc., tell how they might be used, and for what age group. Try to work out a cooperative arrangement with other churches.

5. Never allow films or filmstrips to be made available for use in place of "a lesson" that was not prepared. A visual presentation needs planning and preparation just as a total study session does.

6. Have everything centrally located so the teachers can preview the materials and pick up supplies. A small work area is also a good idea.

By constantly promoting your new department, and working efficiently, it will soon be realized how valuable it has become, and more money will be budgeted for media.

So much material (records, films, filmstrips, etc.) is available now. It is difficult, if not impossible, to know what to buy or rent that will be suitable for your needs, so that your limited funds will be spent wisely.

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Publications are available as a great help in this area. Audio-Visual Resource Guide (AVRG), available from the Broadcasting and Film Commission of the National Council of Churches, lists and evaluates over 3000 projected resources. In it you will find the playing time or number of frames, whether color or black and white, when produced and by whom, where available and the purchase price if a filmstrip, or the rental fee if a movie. It also gives a description of the material, how it has been rated by a cross section of viewers of various denominations, how it can be used, and for what age group.

Another publication, Media, is similar to the AVRG, but also lists flat pictures and posters.

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ANNEX II

MEMORANDUM ON RESEARCH

DESIGN SELECTION

To: Rev. Locke E. Bowman, Jr., PACE Director

From: Dr. Frederick D. Levan, Consultant

Subject: Experimental Designs for PACE, The Arizona Experiment

In a PACE-type setting only two experimental designs were considered feasible - viz., the simple-randomized design and the treatments-by-levels design. The following paragraphs collectively present the rationale used in the selection of the treatments-by-levels design.

Purposes of the Experiment. The major purpose of the experiment is to determine if the treatments have different average effects on the members of the specified population. For this purpose, it is desirable to test the null hypothesis that the population mean is the same for all treatments. Each such mean represents the average effect of the treatment for individuals in all "levels" in the control classification. This hypothesis does not imply that the relative effects of different treatments are the same for all levels; one treatment may be much more effective than another at one level but less effective or even inferior to the same treatment at another level.

A second purpose of the experiment is to determine whether or not the treatments have the same relative effects at all levels, that is, to determine whether or not there is any "interaction" of treatments and levels. The corresponding hypothesis to be tested is that the differences among treatment population means are the same for all levels. If either or both of these general hypotheses are rejected, the experimenters will become interested in various subordinate or more specific hypotheses concerned with individual pairs of treatments or with individual levels.

Advantages of the Treatments-by-Levels Design. The major advantage of the selected design over the simple-randomized design is that for the same number of subjects the treatments-by-levels design is more precise and more

efficient. A second advantage of the design is that it may yield valuable information concerning a possible interaction between treatments and levels that could not be derived from a simple-randomized design. In most A X L experiments, interaction-type information is of theoretical interest only, since whatever treatment is to be employed in practice will ordinarily be used with heterogeneous groups containing individuals from all levels.

Another important advantage of the treatments-by-levels design is that the assumptions underlying the test of significance of the treatments effect are in general much more likely to be valid than is the case with the simple-randomized design.

Limitations of the Design. The principal limitation of the treatments-by-levels design is the same as that of the simple-randomized design. Neither design takes cognizance of Type G or Type R errors. A second limitation is the greater amount of time and effort required to organize the subjects into levels when utilizing the treatments-by-levels design.

Basic Features of PACE's Experimental Design. Before each of the five major experiments, all available subjects will be divided into L different groups of levels, and in order to maximize the number of subjects to be employed from among those available, the number selected at random from each category will be the largest possible multiple of the number of treatments. This division will be based on non-ordered categories applicable to the members of the population. Within each level, the subjects will be randomly assigned to the A subgroups corresponding to the treatments. The criterion measures for the subjects will then be tabulated in a double-entry table of L rows and A columns, the rows corresponding to levels, the columns to treatments, and the cells to subgroups within the various levels. The total sum of squares for the table will then be analyzed into four components -- i.e., treatments, levels, treatments X levels, and within subgroups.

ANNEX III

THE EVALUATORS' REPORT

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ARIZONA STATE
UNIVERSITY
COLLEGE OF EDUCATION
TEMPE, ARIZONA 85281

May 26, 1970

The Reverend Locke E. Bowman, Jr.
The Arizona Experiment
6947 East MacDonald Drive
Scottsdale, Arizona 85253

Dear Locke:

Enclosed you will find a copy of "Experimental and Correlational Studies Related to Church Teacher Performance and Competencies" as per our contract with you in evaluating the Arizona Project.

It has been almost two years since Dr. Levan and I became involved in your project as the evaluators and as we look back we are most pleased with the results. As you know, the compilation of the data was monumental in many regards - as 500,000 pieces of data were involved in the statistical analysis which at times even confounded the computer.

As we have stated to you many times personally, we feel that the evaluation results indicated that your project was worthwhile and the data that we compiled also indicated that a multitude of future research activities could be pursued.

In summary, Dr. Levan and I have appreciated working with you and the others on the project and again express our confidence as to the efficacy of the past activities evaluated and the future activities you have planned as a result of the project.

Cordially,

Thomas H. Metos

Thomas H. Metos
Associate Professor

Frederick D. Levan

Frederick D. Levan
Associate Professor

Enclosure

EVALUATION AND INVESTIGATION OF THE INSTRUCTIONAL PROGRAMS OF THE PROJECT FOR THE ADVANCEMENT OF CHURCH EDUCATION (PACE) 1968-1970[1]

Experimental and Correlational Studies Related to Church Teacher Performance and Competencies

Information from the instructional programs of the Project for the Advancement of Church Education (PACE), conducted March 1, 1968, to March 1, 1970, in the Phoenix metropolitan area, was generated within two quite different approaches. The primary facet produced data from a series of experiments designed to test crucial hypotheses. The second approach was correlational in general nature and purpose, designed to answer a number of questions about the subjects in the major experiments. Both the experimental and correlational phases are explained in the report that follows.

Experiments and Associated Hypotheses

Within the overall framework of the instructional project, seven experiments were conducted. Five experiments were considered to have been of major importance. Each of these five had a treatment factor and an organismic factor. In each of the two-way classification systems, the number of treatment conditions remained constant; however, the number of levels related to the control variable was somewhat differential from experiment to experiment. Two of the seven experiments were assigned a role considered to have been of secondary importance. These two experiments had one-way classifications involving two-sample cases, independent samples. In addition to the one- and two-way classification system differences between the two sets of experiments, the sets also differed in terms of their criterion measures. Gain scores were

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[1]A report from the PACE evaluators, Dr. Thomas H. Metos and Dr. Frederick D. Levan, submitted May 26, 1970, to the PACE Director, the Rev. Locke E. Bowman, Jr., in fulfillment of their contract for supervising the research and analyzing the resultant data.

not utilized in any of the major experiments, but they were used as criterion measures in the two minor experiments.

For the primary set of five experiments, the major purpose was to determine if three complex and unordered (i.e., a categorical treatment classification) treatments (viz., the experimental conditions) had different average effects on members of a specified population. The population was composed of church teachers who were available. Taking such a purpose into consideration, the null hypothesis that the population mean was the same for all treatments was tested. An additional, but less important, purpose of the study was to determine whether or not the treatments had the same relative effects at all levels; that is, to determine if there was any interaction of treatments and levels. The corresponding null hypothesis which was tested was that the differences among the three treatment population means were the same for all levels. In cases where the primary hypothesis was rejected, more specific hypotheses related to individual pairs of treatments were tested. More precisely, the following hypotheses were tested for each of the five focal experiments.

Hypothesis 1

The treatments have the same effect on the mean of the criterion scores for the population from which the experimental sample was drawn; that is, the means of the hypothetical populations corresponding to the three treatments are identical.

Hypothesis 1.1 The means of the hypothetical populations which correspond to treatments A_1 and A_2 are the same.

Hypothesis 1.2 The means of the hypothetical populations which correspond to treatments A_1 and A_3 are the same.

Hypothesis 1.3 The means of the hypothetical populations which correspond to treatments A_2 and A_3 are the same.

Hypothesis 2

The difference between subpopulation means for corresponding treatments is the same for all levels.

For the two rather minor experiments in the study, the purpose was to determine if two complex and unordered treatments had different average effects on members of a specified population; namely, church teachers who were both available and accessible. The null hypothesis that the population mean was the same for all treatments was tested. Explicitly, the hypothesis which follows was tested for each of the two experiments.

Hypothesis 3

The treatments have the same effect on the median of the criterion scores for the population from which the experimental sample was selected. Stated differently, the medians of the hypothetical populations corresponding to the treatments are the same.

Experimental Designs

A treatments-by-levels (A x L) design was utilized in structuring each of the five basic experiments. Only one experiment (E_I) had a 3 x 4 format. Experiments II, III, V, and VI had 3 x 2 formats. Because of the instructional project's general nature and purpose, it was necessary to vary the number of levels from one experiment to the other. For each of the two minor experiments (E_{IV} and E_{VIII}), a simple-randomized design was utilized for structural purposes. In contrast to the other five experiments, only the A_1 and A_2 treatments were used, and leveling or blocking was not a consideration.

Treatments and Levels. The treatments (A_1, A_2, and A_3) were, in a categorical-classification sense, complex and unordered. A_1 was, in broad terms, a laboratory-oriented condition and A_2 was a workshop condition; but there were many respects instead of only one in which the conditions differed. Condition A_1 represented greater amounts of some components than condition A_2 and smaller amounts of other components, so that there was no clear basis for

ranking the treatments in any order. A_3 was the control condition where neither laboratory-oriented nor workshop-oriented conditions were experienced.

The levels (L_1, L_2, L_3, and L_4) were considered to be non-ordered categories of an organismic-type, discrete classification control variable. Such levels did not correspond to different scale intervals referable to a single continuous variable. Instead, their identification and implementation was based on an elementary objective of experimental design; namely, that precision is generally increased when levels of a control variable are introduced. The levels contained church teachers who were interested in and were presently teaching church pupils who were attending the first and second (L_1), third and fourth (L_2), fifth and sixth (L_3), and seventh and eighth (L_4) grades of public or private schools. The control factor was identified as an organismic, non-ordered interest variable.

Assignment of Subjects. Within each level of the control variable for the five experiments, the subjects (S_s) were randomly assigned to one of the three experimental conditions. After assignments had been made, the S_s who were treated under the A_1 and A_2 conditions became the experimentals (E_s), and the subjects who were assigned to the A_3 condition became the controls (C_s).

For each of the two minor experiments, the S_s were randomly assigned to two groups, administrative arrangements were made to accommodate the groups, and then the A_1 and A_2 treatments were randomly assigned to the groups.

Correlational Studies and Associated Hypotheses

An adjunct purpose of the study was to determine whether differentially numbered sets of certain variables reflecting personality, mental ability, attitude, value structure, and knowledge of church education, were related to church-oriented teaching competency. In order to achieve such a purpose,

a random sample of 67 subjects was selected from a tested population of 114 church teachers who had been experimentally exposed to either laboratory (A_1) or workshop (A_2) training. The adjunct purpose was further clarified by finding answers to the following questions.

Question 1: Is personality related to church-oriented teaching competency?

In what ways may 25 attributes representing a personality set and 28 scales representing a competency set be combined to make the correlation between components of the two sets a maximum? What are the primary personality attributes? What are the basic competency scales?

Question 2: Is mental ability associated with church-oriented teaching competency?

How may three factors representing a mental ability set and 28 scales referable to a competency set be combined to make a maximum correlation between variables of the two sets? Which mental ability factor is the most important? What are the focal competency scales?

Question 3: Is attitude related to church-oriented teaching competency?

In what ways can six factors composing an attitude set and 28 scales identified as a competency set be combined to make a maximum correlation between components of the two sets? What attitudinal factors are basic? Of which scales is the criterion primarily composed?

Question 4: Are the values exhibited by church teachers related to competency in church teaching?

How may a set of six values representing the dominant interests of church teachers and a set of 28 competency variables be combined to make the correlation between the components of the two sets a maximum? What are the focal values? Which components of the criterion are primary?

Question 5: Is knowledge of religion associated with church-oriented teaching competency?

Correlational Designs

Both bivariate- and multivariate-type designs were implemented to structure the five correlational studies. Since four of the studies were directed at answering research questions concerning hypothesized relationships between two sets of variables, three alternative multivariate procedures were available for the purposes of statistical analysis. With one procedure, the researchers could have moved directly to the possible bivariate relations in

each study and reported those proving significant. Had this been done, however, the investigators would not have known what degree of confidence they could have placed in the four separate, overall hypotheses.

A second procedure known as the principal components method was considered and could have been utilized on each set, and then correlations of the resulting component scores could have been done; however, it was doubtful that either the principal components of the criterion sets or the other differentially numbered correlate sets would have been meaningful, since if either of the sets had been multidimensional, the principal components would not have covered the domains of interest. Within the principal components procedure, one possibility would have been to examine the relations between the differential correlate sets and the principal component of the 28 criteria by multiple regression analysis. This approach would have been reasonable if the criterion of interest had been the factor the 28 scales of competency measured in common.

After careful consideration had been given to both the bivariate and principal components procedures, the evaluators decided that a third approach (i.e., canonical correlations) was much more desirable. It came closest to answering the primary research questions. The utilization of canonical correlations allowed an overall test of relationship between the sets of variables, it allowed the sets to be combined in all possible ways to make the correlation between components a maximum, and it identified the contributions that individual variables made to the significantly related canonical variates.

One correlational study's design was rather simple. The research question asked only that a determination be made of the relationship between knowledge of church education and church-oriented teaching competency; namely, it asked if the knowledge variable was related to the overall

competency variable in the population from which the sample was drawn.

Multivariate Designs. Each of the four canonical-correlation analyses had a left-hand set of 28 criterion components. The 28 variables represented 27 observational scores and one aggregate score which were considered as measures of church-oriented teaching competency. Although the number of left-hand set components remained constant across all four studies, there were differentially numbered right-hand sets of correlate variables. One design was composed of 25 personality attributes; two of the other analyses had six correlate variates which were identified as attitudinal and value components. A fourth analysis had three right-hand mental ability variables. The criterion and correlate sets were both listed and described as appendices.

Bivariate Design. Since the instructional project was basically a project directed at producing or improving teaching competency in the church, the project's director was interested in determining if there was any relationship between knowledge of church education possessed by E_s and their observed competency. A two-variable format of the Pearson product-moment correlation procedure was implemented by the evaluators in order to correlate the knowledge scores exhibited by the subjects with their aggregate competency scores.

Experimental Results

Although tests of significance applied to the five major experiments produced several important findings related to treatment differentials, it was noted that a complete lack of either ordinal or disordinal interaction existed. In addition to the lack of interaction, an inspection of the same experiments allowed no identification of significant level differences; therefore the researchers failed to reject any of the hypotheses connected with interaction and level-oriented phenomena.

In contrast to the results of the major experiments, an analysis of the data related to the two minor or adjunct experiments (E_{IV} and E_{VII}) revealed no significant findings. The lack of worthwhile resultants seemed to have been a function of poor control; that is, the N's were too variable, the N's were too small to produce appropriate degrees of freedom, there was a considerable amount of subject mortality, and an inordinate number of the gain scores were negative which suggested that a regression phenomenon was operative. In summary, the results were a function of mortality, regression, and lack of reliability.

Experiments I, II, III, V, and VI

The findings associated with the ten major hypotheses and the fifteen minor hypotheses were the results of post-treatment control group comparisons among groups of subjects who experienced one of three experimental conditions -- viz., conditions A_1, A_2, and A_3.

Hypothesis One (H_1) There are no differences among the means of the three hypothetical treatment populations.

Hypothesis 1.1 ($H_{1.1}$) The means of the hypothetical populations corresponding to the treatments A_1 and A_2 are the same.

Hypothesis 1.2 ($H_{1.2}$) The means of treatment populations A_1 and A_3 are identical.

Hypothesis 1.3 ($H_{1.3}$) There are no mean differences between the A_2 and A_3 treatment populations.

Hypothesis Two (H_2) There are no differences among sub-population means for corresponding treatments at all levels.

Statistical Tests for H_1, $H_{1.1}$, $H_{1.2}$, $H_{1.3}$, and H_2 In each of the five major experiments, *F* tests (two-way analysis of variance) were utilized to determine the significance of mean competency score differences among experimental and control subjects. Whenever significant *F* ratios were calculated, *t* tests were made of the differences between individual pairs of means, and the significance of these differences was determined.

Results (Experiment I) An inspection of the *F* ratios reported in Table 1* revealed the existence of a significant difference among the means of the experimental conditions. After determining the differences

*Tables 1-24 form Appendix A.

among pairs of condition means, one significant difference was found between the mean competency scores of the laboratory and workshop subjects. The workshop treatment seemed to have produced considerably more competency than the laboratory treatment. A review of the observed differences among the group means which were listed as entries in Table 8 identified both a 10-unit T difference and a one-unit rating scale difference, and the critical difference of 7.592 was exceeded only in the A_1-A_2 case with $A_2<A_1$. In terms of dispositions, H_1 and $H_{1.1}$ were rejected. In contrast, $H_{1.2}$, $H_{1.3}$, and H_2 received a "failure-to-reject" disposition.

Results (Experiment II) One F ratio was within the region of rejection. Again, as was the case with Experiment I, a significant difference was identified among the mean competency scores of the experimental and control subjects -- i.e., the mean scores of the treatment groups were dependent on the differential treatments. The variance ratios were listed in Table 2. Critical ratio tests (t tests) between pairs of treatment means produced two values which exceeded the required 10.537 critical difference value. A study of the mean differences enumerated in Table 8 suggested that the mean differences of laboratory-versus-control and workshop-versus-control subjects were beyond the crucial referent ($A_1<A_3$ and $A_2<A_3$). H_1, $H_{1.2}$, and $H_{1.3}$ were rejected. Both $H_{1.1}$ and H_2 were accepted.

Results (Experiments III, V, and VI) Reviews directed at the data which were listed in Tables 3, 4, and 5 indicated that none of the F ratios approached significance. The means of the treatment groups were independent of the experimental conditions. Since no differences were found among the three groups, t tests between individual pairs of means were inappropriate. None of the associated hypotheses in any of the last three major experiments were rejected.

Results (Aggregate) Ordinarily the experimenters would not have attempted to pool the experimental results related to the five major experiments; however, a summary seemed an important and necessary adjunct to the instructional project's objectives. Because a treatments-by-levels-by-replications design and analysis were considered impossible to justify, all five matrices were collapsed and the data were properly pooled by treatments and levels. The pooled results were reported as entries in Table 6. An F of 5.60 which was indicative of significant differences among subjects who experienced the experimental conditions was calculated, and one mean difference which surpassed the critical value of 4.51 for individual pairs of means existed between the A_2's and A_3's. The observed differentials were enumerated in Table 8. For the A_2-A_3 case, $A_2<A_3$. H_1 and $H_{1.3}$ were rejected, and $H_{1.1}$, $H_{1.2}$, and H_2 were accepted.

Experiments IV and VII

Unlike the criterion scores utilized in the five major experiments, differential competency between the treatment groups was determined by gain scores. Since gain (positive, negative, or zero) as a variable can be measured in five different ways, it was considered as a relatively unstable

referent; however, a cursory inspection of the phenomenon as it existed in the experimental setting was called for as a focus which might provide or generate an additional worthwhile index of the competency criterion in future instructional projects of the INSTROTEACH variety.

The results of the experiments and the dispositions related to the two hypotheses were based on the findings of dual pre- and post-treatment two-group comparisons between subjects who experienced one of two experimental conditions; namely, the subjects were assigned to either the A_1 or A_2 treatment groups.

Hypothesis Three (H_3) There are no differences between the median competency gain scores of the two treatment groups.

Statistical Tests for H_3 Since the statistical models related to experiments IV and VII were structured around two-sample cases with independent samples, Mann-Whitney U tests were applied to the data as tests of significance. In addition to the statistical model considerations, the investigators were convinced that the U tests were more appropriate than corresponding t tests for unusually small sample having both unequal numbers and highly divergent values along with badly skewed data conditions.

Results (Experiments IV and VII) After consideration had been given to the data in Tables 9 and 10, it became clear that no differences were exhibited between the A_1 and A_2 treatment groups in either E_{IV} or E_{VII}. Both U's were well out of the rejection region. In both instances, the tests failed to reject H_3.

Conclusions and Implications Related to the Experiments

From an aggregate perspective, the three complex and unordered treatments had different average effects on members of a population of church teachers who were available for experimental purposes over a two-year period of time. After training, the subjects who had been exposed to the workshop treatment were considerably more competent than subjects who had received either laboratory treatment or subjects who had experienced the control condition. In support of the overall findings, workshop participants ranked first in three of the five individual experiments.

In a molecular sense, the treatments also had different average effects on experimentals and controls who were treated in E_I and E_{II}. Both workshop and laboratory trained church teachers had developed greater competency than teachers who had experienced only the control condition. Although the findings were not reported under the results' section of this report, there were two experiments (E_V and E_{VI}) whose conditions produced differential effects among the treatment groups at less than the .11 level. Experiment V had a F that fell within the .10 level's region of rejection. In both cases the workshop subjects had developed more competency than either the laboratory or control subjects had developed.

In all five experiments the three treatments had the same relative effects at all levels of the "interest in teaching at a specific grade level" control variable; that is, there was no evidence of interaction. An absence of interaction strengthened, even more, the findings and conclusions related to the treatment effects.

Conclusions based on the findings of the instructional project's two minor experiments (E_{IV} and E_{VII}) were minimal. In both experiments observed gains (in many cases the gain scores were highly negative) were considered independent of treatment conditions. Any differences between groups were identified as functions of a number of phenomena such as chance fluctuations expected in random selection and assignment, mortality of subjects, and regression. In summary, the evaluators viewed the two experiments as having been of limited worth.

The results of the five major experiments implied that workshop training was effective as an experimental condition. It produced higher competency in those subjects who were exposed to it, and its continued use in the training of church teachers was recommended by the evaluators. Another implication was generated as a result of E_{II}: The laboratory treatment holds promise for

future instructional projects and should be viewed as worthy of continued development.

The results of the inquiry also implied that the gain scores as criterion measures hold limited promise as indices for competency or change-in-competency referents.

Correlational Results

The four multivariate analyses generated a rather extensive number of findings. In one of the correlational studies (CS_I), comprehensive canonical results suggested an overall relationship between the criterion set and the correlate set. It should be recalled that in canonical-correlation studies both multiple criteria and multiple correlates are involved. Each pair of canonical variates is maximally correlated. Geometrically, the canonical correlation can be considered as a measure of the extent to which individuals occupy the same relative positions in the p dimensional space as they do in the q dimensional space. Two sets of variates might appear dissimilar when compared scale for scale, but canonical-correlation methods would reveal the system of correlation underlying the two sets. Basically, as the method was used in the four correlational studies presented in this text, the canonical correlations were the maximum correlations between linear functions of four two-dimensional sets of variables.

Correlational Studies I and II

CS_I's numerous variables (a total of 53: 25 SORT attributes against 28 INSTROTEACH components) allowed considerable reliability and confidence to have been placed in its findings.

Question 1 (Q_1) Was personality related to church-oriented teaching competency? If so, in what ways were 25 attributes representing a personality set combined with 28 components representing a competency set to make the correlation between the variables of the two sets a maximum? What were the primary personality attributes, and what were the basic competency components?

Statistical Tests for Q_1 and Q_2 Canonical correlations were calculated in both cases. Bartlett's definition of lambda (Λ) was utilized, and the $\underline{X}^2$ approximation for the distribution of Λ provided a test for the null hypotheses that the two sets of correlate variates were unrelated to the criterion-variate sets. The left-hand components for all CS's were listed as Appendix E. Appendices F, G, and H contain both listings and definitions of the personality and mental ability sets; that is, the right-hand sets. The same statistical tests and appendices were also utilized for questions 3 and 4.

Results (Correlational Study I) A maximum canonical correlation ($\underline{R}_c i$) of .96 was computed, and the coefficient was significant at the *a priori* .05 level; therefore, it was determined that there was at least one significant way in which the two domains were related. An inspection of the data in Table 19 revealed no further meaningful combinations between the personality and competency variables after the first pair of canonical variates had been identified. A study of the matrix entries in Table 15 suggested that out of 700 bivariate relations, only 33 correlation coefficients were significant. Intercorrelational work in the form of Tables 12 and 13 yielded 307 greater-than-chance coefficients out of a possible 1409 Pearson product-moment correlations. These significant coefficients contributed to the significantly related canonical vectors. An investigation of the loadings revealed that variables MFCCF, HPA, FMF-FM, M, F, and W were the primary personality correlates involved, and that the criterion was primarily composed of $OSIS_A$, OS_7, IS_{25}, OS_9, IS_{26}, OS_{14}, OS_1, OS_{19}, IS_{16}, and OS_5.

Question 2 (Q_2) Was mental ability associated with church-oriented teaching competency? If such a relationship were the case, how were the three factors of the mental ability set combined with the 28 components of the competency set to maximize the correlation between the two sets? Which mental ability factor was the most important? What were the focal competency scales?

Results (Correlational Study II) A review of Table 20's $\underline{X}^2$ tests of successive latent roots revealed an $\underline{R}_c$ maximum of only .68 which was not enough to reject the null hypothesis that the correlate variates were unrelated to the criterion variates. An inspection of the coefficients listed in the correlational matrix (Table 16) suggested two negative greater-than-chance relationships. Such results were very disappointing to the research team, since it was believed that there should have been more than just two significant coefficients out of 84 possible bivariate combinations. The intercorrelations between the mental ability variables were reported as entries in Table 14, and a study of the coefficients showed high relatedness in all cases. Since the canonical variates were not related, only the contributions of the mental ability set's individual variables were entered as weights or loadings in Table 24. The relative loadings suggested that variable T was the most important mental ability factor. Although the weights of the individual competency components were not reported, $OSIS_A$ was heavily loaded with both no roots removed and one root removed. Members of the investigational team, however, felt that where no significance between the canonical variates existed, the reporting of any loadings affixed to any of the individual variables was somewhat misleading to potential readers. As a result of this belief, any reporting of this type was restricted to the right-hand sets which later comprised the elements of Table 24.

Correlational Studies III and IV

Both CS_{III} and CS_{IV} had six right-hand variables. In one case the components of attitude were presented, and in CS_{IV} the variates were value measures. For CS_{III} the MTAI was utilized for gathering data, and in the latter investigation the Study of Values served to measure the correlate set. In both studies, the criterion sets (i.e., the left-hand sets identified as competency domains) were composed of 28 scales (viz., INSTROTEACH components).

Question 3 (Q_3) Were attitudes toward teaching and toward pupils related to church-oriented teaching competency? In what ways were six factors composing an attitude set and 28 scales identified as a competency set combined to make a maximum correlation between the components of the two sets? What attitudinal factors were basic? Of which scales was the criterion primarily composed?

Results (Correlational Study III) The maximum canonical correlation (.80) reported in Table 21 was not significant. The attitudinal measures as a set were not linearly related to the competency set. There was either no relationship, or the association was not linear. On the other side of the ledger, however, there were 20 significant bivariate relationships reported as coefficients in Table 17. Twenty greater-than-chance associations out of a possible 168 represents a condition not entirely devoid of potential for future research. The intercorrelations enumerated in Table 14 under the attitudinal section were reviewed, and 12 out of 15 coefficients were judged significant. Since attitude was not related to competency on a set basis, the contributions of individual variables to either of the unrelated sets would not have been reported; however, the researchers felt that the loadings (viz., the weights) of the correlate or right-hand set needed some presentation. The relative weights were listed in Table 24, and an inspection of the values showed that the basic attitudinal factor was the MTAI followed by the variables F_{III} and F_{IV}. The competency variables were so poorly weighted (i.e., the loadings were extremely low: e.g., $OSIS_A$, the highest weight, was only .33) that to have reported them was considered a waste of time.

Question 4 (Q_4) Were the values exhibited by church teachers related to competency in church teaching? How were a set of six values which represented the dominant interests of church teachers and a set of 28 competency variables combined to have made the correlation between the components of the two sets a maximum? What were the focal values, and which components of the criterion were primary?

Results (Correlational Study IV) Although a canonical correlation of .81 was computed between the value and competency sets, the χ^2 tests of successive latent roots proved insignificant. There seemed to be no way in which the two sets were related. The null hypothesis was not rejected after a review of the results listed in Table 22. Using a bivariate referent in the form of a correlational matrix (Table 18), the experimental team identified only seven significant relationships from a possible 168 Pearson product-moment correlation coefficients. The greater-than-chance intercorrelational

coefficients listed in Table 14 numbered seven. It was noted that all of the values were negative in nature. There was no dominant variable which loaded unusually high when compared on a relative basis with the other value-set components in Table 24. Unlike the weights in the previously reported correlational studies, the variables were practically equal. Competency-set variates were so low in their weights that any report concerning them would have been totally useless.

Correlational Study V

Unlike the multivariate studies, CS_V was, by its very nature, a bivariate study. Because the study was of secondary interest and promised to generate little in the way of profound implications, it was viewed as a pilot investigation.

Question 5 (Q_5) Was a knowledge of church education associated with church-oriented teaching competency?

Results (Correlational Study V) A Pearson product-moment correlation of -.10 was calculated between the two variables. A finding of this dimension, especially with 109 degrees of freedom, strongly suggested that in the population from which the sample was drawn, there was no relationship between competency as measured by the INSTROTEACH and knowledge of church education as measured by the Test on Church Education. In brief, the variates were independent. The means and standard deviations of both the $OSIS_A$ competency referent (i.e., the variable used in this study) and the TOCE variable were listed as entries in Table 11 along with the means and standard deviations of all other variables which were reported in the correlational studies.

Conclusions and Implications Related to the Correlational Studies

After a comprehensive review of the correlational results was completed, the investigators generated one major conclusion: there was a sense in which personality was related to church-oriented teaching competency. The results indicated that the primary competency component in the personality case, as in all other cases, was the aggregate measure; that is, the $OSIS_A$ variable was the key referent. The researchers were elated to see that variable $OSIS_A$ was dominant, since they had used it as the criterion measure during the experimental period of the instructional programs.

The relationship between competency and mental ability, attitudes toward teaching and pupils, and values representing the dominant interests of church teachers were all considered as chance relationships. Although only chance

relationships were expected, the findings were not considered useless. Enough bivariate associations were reported to generate additional hypotheses for future investigations (in both the present data and in future experiments). In addition, the canonical correlations and their associated variances were, as a whole, rather impressive when the correlate-criterion sets were considered. Future studies seemed to be justified to further check out the canonical results; e.g., multivariate canonical-type cross-validation studies should be completed on other samples from different populations.

It appeared that there was no justification for further work related to the determination of relationships between competency and knowledge of church education (at least as it was used in the present study).

From a psychometric perspective, the huge amounts of data in the form of intercorrelational and correlational matrices, canonical and latent root tables, and double sets (right- and left-hand loadings) of canonical vectors will provide enough generative potential to keep interested researchers fully occupied for several years (both in the analysis of present data and in future research). Although very small segments of the computed data were presented in this particular report, the Project Director possesses a preponderant quantity of computerized output.

APPENDIX A

(TABLES 1 - 24)

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TABLE 1
ANALYSIS OF VARIANCE FOR EXPERIMENT I

Sources of Variation	Degrees of Freedom	Mean Squares	F Ratios	Probabilities
Treatments (A)	2	189.875	3.9116	.0484
Levels (L)	3	50.931	1.0492	.4076
Treatments X Levels (AL)	6	8.597	0.1771	.9768
Error (within)	12	48.542		

TABLE 2
ANALYSIS OF VARIANCE FOR EXPERIMENT II

Sources of Variation	Degrees of Freedom	Mean Squares	F Ratios	Probabilities
Treatments (A)	2	306.250	8.2584	.0193
Levels (L)	1	4.083	0.1101	.0781
Treatments X Levels (AL)	2	46.583	1.2562	.3509
Error (within)	6	37.083		

TABLE 3
ANALYSIS OF VARIANCE FOR EXPERIMENT III

Sources of Variation	Degrees of Freedom	Mean Squares	F Ratios	Probabilities
Treatments (A)	2	46.083	0.3854	.6989
Levels (L)	1	60.750	0.5080	.5075
Treatments X Levels (AL)	2	33.250	0.2780	.7683
Error (within)	6	119.583		

TABLE 4
ANALYSIS OF VARIANCE FOR EXPERIMENT IV

Sources of Variation	Degrees of Freedom	Mean Squares	F Ratios	Probabilities
Treatments (A)	2	316.292	2.7283	.0909
Levels (L)	1	135.375	1.1677	.2944
Treatments X Levels (AL)	2	82.625	0.7127	.5076
Error (within)	18	115.931		

TABLE 5
ANALYSIS OF VARIANCE FOR EXPERIMENT V

Sources of Variation	Degrees of Freedom	Mean Squares	F Ratios	Probabilities
Treatments (A)	2	157.542	2.4859	.1099
Levels (L)	1	165.375	2.6095	.1204
Treatments X Levels (AL)	2	49.875	0.7870	.5260
Error (within)	18			

TABLE 6
ANALYSIS OF VARIANCE FOR ALL EXPERIMENTS COMBINED

Sources of Variation	Degrees of Freedom	Mean Squares	F Ratios	Probabilities
Treatments (A)	2	449.094	5.5993	.0055
Levels (L)	3	78.750	0.9819	.5932
Treatments X Levels (AL)	6	81.052	1.0106	.4247
Error (within)	84	80.205		

TABLE 7

COMPARISONS OF TREATMENT GROUPS AFTER EXPOSURE TO DIFFERENTIAL CONDITIONS IN TERMS OF NORMALIZED STANDARD SCORE MEANS, SCALE BASED RATING SCORE MEANS, AND F RATIOS FOR EXPERIMENTS I, II, III, V, AND VI

Experiments	Number of Subjects	EXPERIMENTAL CONDITIONS: Laboratory (A_1) T Score Means	Laboratory (A_1) Rating Score Means	Workshop (A_2) T Score Means	Workshop (A_2) Rating Score Means	Control (A_3) T Score Means	Control (A_3) Rating Score Means	Statistical Values F
E_I	24	48.50	3.50	58.13	4.50	52.00	3.88	3.91*
E_{II}	12	60.50	4.75	58.00	4.50	44.00	3.00	8.26*
E_{III}	12	43.00	5.00	37.00	4.25	37.25	4.50	0.39
E_V	24	45.25	3.02	53.38	3.50	41.00	2.64	2.73
E_{VI}	24	43.25	2.88	52.13	3.88	47.75	3.38	2.49
Aggregate	96	48.47	3.83	53.97	4.13	46.81	3.48	5.60**

*Significant at .05 level (** .01)

TABLE 8

COMPARISONS OF TREATMENT GROUPS IN TERMS OF DIFFERENCES BETWEEN PAIRED MEANS FROM DATA OF TABLE 7

Experiments	TREATMENT GROUPS			Critical Difference Values
	A_1 vs. A_2 $\bar{T}$ Score Differences	A_1 vs. A_3 $\bar{T}$ Score Differences	A_2 vs. A_3 $\bar{T}$ Score Differences	
E_I	9.63*	3.50	6.13	7.59
E_{II}	2.50	16.25*	13.75*	10.54
Aggregate	5.50	1.66	7.16*	4.51

*Significant at .05 level.

TABLE 9

COMPARISONS OF DIFFERENTIAL TREATMENT GROUPS FOR EXPERIMENTS IV AND VII BY INDIVIDUALIZED AGGREGATE PRETEST-POSTTEST RATING SCORE DIFFERENCES

	TREATMENT GROUPS						Statistical Values	
	Laboratory (A_1)			Workshop (A_2)				
EXPERIMENTS	Subjects	Difference Scores	Ranks	Subjects	Difference Scores	Ranks	U	Probabilities
E_{IV}	S_1	- 5	1	S_6	5	3		
	S_2	0	2	S_7	10	4		
	S_3	13	5			R_1 = 7	4	.858
	S_4	23	6					
	S_5	47	7					
			R_2 = 21					
E_{VII}	S_1	-29		S_9	-41	1		
	S_2	-24		S_{10}	-36	2		
	S_3	-24		S_{11}	-21	6		
	S_4	- 2		S_{12}	-19	7	13	.354
	S_5	6		S_{13}	19	12		
	S_6	6				R_1 = 28		
	S_7	9						
	S_8	22						
		R_2 = 63						

TABLE 10

COMPARISONS OF DIFFERENTIAL TREATMENT GROUPS FOR EXPERIMENTS IV AND VII BY INDIVIDUALIZED AGGREGATE PRETEST-POSTTEST NORMALIZED STANDARD SCORE DIFFERENCES

	TREATMENT GROUPS						Statistical Values	
	Laboratory (A_1)			Workshop (A_2)				
EXPERIMENTS	Subjects	Difference Scores	Ranks	Subjects	Difference Scores	Ranks	U	Probabilities
E_{IV}	S_1	-36	1	S_6	6	2	3	.572
	S_2	10	3	S_7	52	4		
	S_3	141	5			$R_1 = 6$		
	S_4	182	6					
	S_5	385	7					
			$R_2 = 22$					
E_{VII}	S_1	-198	3	S_9	-351	1	13	.354
	S_2	-186	4	S_{10}	-263	2		
	S_3	-181	5	S_{11}	-154	6		
	S_4	6	8	S_{12}	-140	7		
	S_5	44	9	S_{13}	144	12		
	S_6	47	10			$R_1 = 28$		
	S_7	65	11					
	S_8	168	13					
			$R_2 = 63$					

TABLE 11
MEANS AND STANDARD DEVIATIONS OF ALL
VARIABLES RELATED TO THE CORRELATIONAL STUDIES

Variables	Means	Standard Deviations
OS_1	50.37	9.10
OS_2	50.21	9.14
OS_3	50.42	9.47
OS_4	50.16	8.83
OS_5	50.10	7.82
OS_6	50.16	7.96
OS_7	50.37	8.33
OS_8	51.06	8.75
OS_9	49.39	8.39
OS_{10}	50.99	8.23
OS_{11}	51.06	9.16
OS_{12}	51.27	8.77
OS_{13}	50.12	8.82
OS_{14}	51.33	9.47
IS_{15}	51.28	8.47
IS_{16}	49.61	8.91
IS_{17}	50.78	8.87
IS_{18}	50.49	8.50
IS_{19}	50.49	8.85
IS_{20}	49.63	8.16
IS_{21}	50.60	8.08
IS_{22}	50.30	8.10

TABLE 11
(Continued)

Variables	Means	Standard Deviations
IS_{23}	49.60	9.02
IS_{24}	50.04	8.72
IS_{25}	49.67	9.02
IS_{26}	49.55	8.38
IS_{27}	50.18	8.24
$OSIS_A$	50.31	4.04
W	51.94	10.06
D	44.72	9.03
Dd	48.51	9.72
WM	49.90	8.76
DM	50.64	8.68
S_1	40.28	12.61
F	49.69	12.22
$F-F_1$	50.21	8.34
HPA	49.81	8.14
H	50.09	10.03
P	46.94	9.63
O	37.15	9.73
S_2	39.73	13.53
FM	51.10	9.60
FCM	50.99	8.85
CFFC	50.30	8.47
FMFCM	49.81	8.13

TABLE 11
(Continued)

Variables	Means	Standard Deviations
FMM	48.84	8.25
FSFch	50.43	8.72
Fch	50.03	9.72
FMF-FM	50.13	8.40
M	52.33	11.34
$F-F_2$	49.58	8.18
MFCCF	50.16	8.63
OP	49.22	8.78
Q	17.00	7.43
V	40.72	10.93
T	57.72	16.39
F_I	7.07	6.57
F_{II}	10.36	4.53
F_{III}	9.58	6.59
F_{IV}	2.45	1.06
F_V	2.59	0.43
MTAI	40.39	29.13
Th	35.12	5.36
E	34.73	7.61
A	35.25	8.62
S	45.55	6.70
P	33.61	5.35
R	55.73	6.59
TOCE	31.89	7.96

TABLE 12
INTERCORRELATIONS OF COMPETENCY VARIABLES

	OS_2	OS_3	OS_4	OS_5	OS_6	OS_7	OS_8	OS_9	OS_{10}	OS_{11}	OS_{12}	OS_{13}	OS_{14}	IS_{15}	IS_{16}
OS_1	.26	.31	.33	.39	.37	.37	.38	*	*	.41	.29	*	*	*	*
OS_2		.35	.31	.27	.46	.43	.45	*	.31	.28	.27	*	*	*	.45
OS_3			.31	*	.38	*	*	.32	.49	*	.26	.31	*	*	.24
OS_4				.31	*	.24	.37	*	.28	.34	.60	.29	*	.31	.28
OS_5					.33	*	.45	*	*	.37	*	*	*	.27	.28
OS_6						.27	.39	.26	.38	.28	.26	*	*	.27	.41
OS_7							.37	*	.27	.44	.25	*	*	*	.35
OS_8								*	*	.45	.32	*	*	.27	.47
OS_9									*	*	*	.26	*	*	*
OS_{10}										.32	*	.31	*	*	.43
OS_{11}											.33	*	*	.37	.52
OS_{12}												*	*	.35	.38
OS_{13}													.30	*	*
OS_{14}														*	*
IS_{15}															.41
IS_{16}															
IS_{17}															
IS_{18}															
IS_{19}															
IS_{20}															
IS_{21}															
IS_{22}															
IS_{23}															
IS_{24}															
IS_{25}															
IS_{26}															
IS_{27}															

TABLE 12 (Continued)
INTERCORRELATIONS OF COMPETENCY VARIABLES

	IS_{17}	IS_{18}	IS_{19}	IS_{20}	IS_{21}	IS_{22}	IS_{23}	IS_{24}	IS_{25}	IS_{26}	IS_{27}	$OSIS_A$
OS_1	.29	.27	*	*	*	.24	*	*	*	*	*	.46
OS_2	.44	.31	*	*	*	.28	*	*	.24	*	*	.57
OS_3	*	.25	.29	*	*	*	*	*	*	*	.27	.50
OS_4	*	.29	*	*	*	*	*	*	*	*	*	.49
OS_5	.26	*	*	*	*	*	*	*	*	*	*	.42
OS_6	*	.28	*	.25	*	.42	*	*	.32	*	*	.56
OS_7	.36	.45	*	.37	.31	*	*	8	*	*	.44	.56
OS_8	.40	.49	*	*	*	.30	*	*	.33	*	*	.60
OS_9	*	*	*	*	*	*	*	*	*	*	.29	.31
OS_{10}	.32	.33	*	*	*	*	*	.28	*	*	.26	.50
OS_{11}	.45	.51	*	*	*	*	.25	.36	*	*	.35	.63
OS_{12}	*	.36	*	*	*	*	*	*	*	*	.41	.55
OS_{13}	*	.28	.25	*	*	*	*	*	*	*	*	.42
OS_{14}	*	*	.25	*	*	*	*	*	*	*	*	*
IS_{15}	.27	*	*	*	*	.47	*	.37	*	*	*	.43
IS_{16}	.45	.49	.25	*	.25	.39	.29	.26	*	.31	.38	.72
IS_{17}		.37	.25	*	.30	*	*	.25	*	*	*	.57
IS_{18}			*	*	.49	*	*	.34	*	*	.39	.65
IS_{19}				*	*	.26	*	*	*	*	*	.31
IS_{20}					.32	*	*	*	.31	*	*	.27
IS_{21}						*	.27	.27	*	.34	.28	.37
IS_{22}							*	*	*	*	*	.41
IS_{23}								.33	.37	*	.33	.41
IS_{24}									*	*	.37	.51
IS_{25}										*	.24	.39
IS_{26}											*	.32
IS_{27}												.55

*Indicates $r < .24$, $p > .05$

TABLE 12A

INSTROTEACH - High Correlations of Scales (N = 28)

.72	IS_{16} x $OSIS_A$	Awareness of peer relationships with aggregate competency score
.65	IS_{18} x $OSIS_A$	Development of student self-concept with aggregate competency score
.63	OS_{11} x $OSIS_A$	Recognition of learning difficulties with aggregate competency score
.60	OS_4 x OS_{12}	Classroom control with social climate
.60	OS_8 x $OSIS_A$	Variety in learning activities with aggregate competency score
.57	OS_2 x $OSIS_A$	Attitude toward opinion with aggregate competency score
.57	IS_{17} x $OSIS_A$	Personal relationships with individual students with aggregate competency score
.56	OS_6 x $OSIS_A$	Teacher-student planning with aggregate competency score
.56	OS_7 x $OSIS_A$	Teacher preparation for classroom session with aggregate competency score
.55	OS_{12} x $OSIS_A$	Social climate with aggregate competency score
.55	IS_{27} x $OSIS_A$	Responsibility for improvement of teaching skill with aggregate competency score
.52	OS_{11} x IS_{16}	Recognition of learning difficulties with awareness of peer relationships
.51	OS_{11} x IS_{18}	Recognition of learning difficulties with development of student self-concept
.51	IS_{24} x $OSIS_A$	Program of personal study with aggregate competency score
.50	OS_3 x $OSIS_A$	Attitude toward opinion with aggregate competency score
.50	OS_{10} x $OSIS_A$	Student inquiry into subject matter with aggregate competency score

TABLE 13
INTERCORRELATIONS OF PERSONALITY VARIABLES

	D	Dd	WM	DM	S_1	F	$F-F_1$	HPA	H	P	O	S_2
W	-.49	-.38	.65	*	*	-.41	*	.25	*	.71	-.48	*
D		*	-.25	.63	*	.34	*	*	*	*	*	*
Dd			*	*	*	.35	*	*	*	-.47	.45	*
WM				.35	*	-.25	*	.36	.40	.66	-.28	*
DM					*	*	*	*	.41	.25	*	*
S_1						.66	.53	*	*	*	*	.94
F							.75	*	*	-.28	.27	.63
$F-F_1$								*	*	*	*	.49
HPA									.53	.31	*	*
H										*	*	*
P											-.57	*
O												*
S_2												
FM												
FCM												
CFFC												
FMFCM												
FMM												
FSFch												
Fch												
FMF-FM												
M												
$F-F_2$												
MFCCF												

TABLE 13 (Continued)
INTERCORRELATIONS OF PERSONALITY VARIABLES

	FM	FCM	CFFC	FMFCM	FMM	FSFch	Fch	FMF-FM	M	$F-F_2$	MFCCF	OP
W	*	.40	.31	*	*	-.41	.40	*	*	*	.31	.60
D	*	*	*	*	*	.41	-.26	*	*	*	*	*
Dd	.31	*	*	*	*	.31	*	*	*	*	*	-.48
WM	.36	.75	*	*	.39	*	*	-.27	.74	*	.62	.53
DM	.53	.53	*	*	.48	.30	-.43	-.40	.72	*	.54	.29
S_1	.45	-.27	-.41	*	*	.34	*	-.39	*	-.52	*	*
F	.67	-.32	-.44	*	*	.74	-.39	-.58	*	-.74	-.26	-.27
$F-F_1$	.55	*	-.34	*	*	.48	*	-.60	*	-.98	*	*
HPA	*	.29	*	.30	.32	*	*	*	.36	*	*	*
H	.38	.37	*	*	.37	*	-.33	-.27	.49	*	.38	*
P	*	.52	*	*	*	*	*	*	.38	*	.41	.84
O	*	-.26	-.30	*	*	*	*	*	*	*	-.39	-.78
S_2	.38	-.31	-.39	*	*	.33	*	-.35	*	-.48	*	*
FM		.31	-.38	*	.55	.64	-.55	-.72	.57	-.53	.31	*
FCM			*	.37	.47	*	*	*	.79	*	.75	.51
CFFC				.27	*	-.32	.25	.35	*	.35	.27	.30
FMFCM					.63	*	*	-.25	*	*	.37	*
FMM						.28	-.40	-.64	.65	*	.52	*
FSFch							-.62	-.42	*	-.46	*	*
Fch								.33	-.41	*	-.27	*
FMF-FM									-.47	.58	*	*
M										*	.76	.36
$F-F_2$											*	*
MFCCF												.46

*Indicates $r < .24$, $p > .05$

TABLE 13A

SORT - High Correlations of Scales (N = 25)

.71	W x P	Theoretical with popular
.65	W x WM	Theoretical with induction
.60	W x OP	Theoretical with conformity
.63	D x DM	Practical with deduction
.66	WM x P	Induction with popular
.75	WM x FCM	Induction with social responsibility
.74	WM x M	Induction with activity potential
.62	WM x MFCCF	Induction with flexibility
.53	WM x OP	Induction with conformity
.53	DM x FM	Deduction with aggressiveness
.53	DM x FCM	Deduction with social responsibility
.72	DM x M	Deduction with activity potential
.54	DM x MFCCF	Deduction with flexibility
.66	S_1 x F	Rigidity with structuring
.94	S_1 x S_2	Rigidity with persistence
.75	F x F-F_1	Structuring with concentration
.63	F x S_2	Structuring with persistence
.67	F x FM	Structuring with aggressiveness
.74	F x FSFch	Structuring with consistency
.55	F-F_1 x FM	Concentration with aggressiveness
.53	HPA x H	Range with human relationships
.52	P x FCM	Popular with social responsibility
.84	P x OP	Popular with conformity

TABLE 13A (Continued)

SORT - High Correlations of Scales (N = 25)

.55	FM x FMM	Aggressiveness with confidence
.64	FM x FSFch	Aggressiveness with consistency
.57	FM x M	Aggressiveness with activity potential
.79	FCM x M	Social responsibility with activity potential
.75	FCM x MFCCF	Social responsibility with flexibility
.51	FCM x OP	Social responsibility with conformity
.63	FM FCM&FMM	Tact with confidence
.65	FMM x M	Confidence with activity potential
.52	FMM x MFCCF	Confidence with flexibility
.58	FMF-FM x F-F_2	Moodiness with impulsiveness
.76	M x MFCCF	Activity potential with flexibility

TABLE 14

INTERCORRELATIONS OF ATTITUDINAL,
VALUE-ORIENTED, AND MENTAL ABILITY VARIABLES

	Attitudinal Variables				
	F_{II}	F_{III}	F_{IV}	F_V	MTAI
F_I	.46	.47	*	.45	.81
F_{II}		.35	*	*	.67
F_{III}			.28	.44	.80
F_{IV}				.33	.46
F_V					.63

*Indicates $r < .24$, $p > .05$

	Value-Oriented Variables				
	E	A	S	D	R
Th	*	*	*	*	-.27
E		-.35	-.45	*	*
A			*	-.25	-.35
S				-.31	*
P					-.29

*Indicates $r < .24$, $p > .05$

Mental Ability Variables

	Q	T
V	.58	.93
Q		.84

TABLE 15
CORRELATION MATRIX:
CORRELATE SET (PERSONALITY) AND CRITERION SET (COMPETENCY)*

Correlate Set	Criterion Set													
	OS_1	OS_2	OS_3	OS_4	OS_5	OS_6	OS_7	OS_8	OS_9	OS_{10}	OS_{11}	OS_{12}	OS_{13}	OS_{14}
W														
D														
Dd														
WM														
DM													.25	
S_1								-.32			-.30		.26	
F														
$F-F_1$									.25		.28			
HPA														.35
H														
P														
O														
S_2								-.34			-.31			
FM														
FCM														
CFFC														
FMFCM			.24											
FMM														
FSFch													.24	
Fch									-.32				-.28	
FMF-FM														
M														
$F-F_2$									-.24		.26			
MFCCF														
OP														

TABLE 15 (Continued)
CORRELATION MATRIX:
CORRELATE SET (PERSONALITY) AND CRITERION SET (COMPETENCY)*

Correlate Set	Criterion Set													
	IS_{15}	IS_{16}	IS_{17}	IS_{18}	IS_{19}	IS_{20}	IS_{21}	IS_{22}	IS_{23}	IS_{24}	IS_{25}	IS_{26}	IS_{27}	$OSIS_A$
W														
D					.32				.28			.40		
Dd														
WM														
DM												.31		
S_1				-.26				-.32						-.26
F														
$F-F_1$				-.25										
HPA														
H														
P												.25		
O											-.27			
S_2				-.30				-.32						-.27
FM														
FCM														
CFFC														
FMFCM												.27		
FMM														
FSFch														
Fch														
FMF-FM												-.26		
M														
$F-F_2$				.24										
MFCCF												.30		
OP												.32		

*All entries $r > .24$, $p < .05$. Other information: $R_{c1} = .96$, $\Lambda = .00$, $\chi^2 = 772.5$, $p < .05$ (See Table 19).

TABLE 16
CORRELATION MATRIX:
CORRELATE SET (MENTAL ABILITY) AND CRITERION SET (COMPETENCY)*

Criterion Set	Correlate Set		
	Q	V	T
OS_1			
OS_2			
OS_3			
OS_4			
OS_5			
OS_6			
OS_7			
OS_8	-.25		
OS_9			
OS_{10}			
OS_{11}	-.26		
OS_{12}			
OS_{13}			
OS_{14}			
IS_{15}			
IS_{16}			
IS_{17}			
IS_{18}			
IS_{19}			
IS_{20}			
IS_{21}			
IS_{22}			
IS_{23}			
IS_{24}			
IS_{25}			
IS_{26}			
IS_{27}			
$OSIS_A$			

*All entries $\underline{r} > .24$, $\underline{p} < .05$. Other information: $\underline{R}_{c1} = .68$, $\Lambda = .46$, $\underline{X}^2 = 39.3$, $\underline{p} > .05$ (See Table 20).

TABLE 17
CORRELATION MATRIX:
CORRELATE SET (ATTITUDE) AND CRITERION SET (COMPETENCY)*

Criterion Set	Correlate Set					
	F_I	F_{II}	F_{III}	F_{IV}	F_V	MTAI
OS_1						
OS_2		.30				.25
OS_3						
OS_4						
OS_5						
OS_6						
OS_7	.29					.26
OS_8	.25	.25				.30
OS_9						
OS_{10}	.27					.26
OS_{11}						
OS_{12}						
OS_{13}						
OS_{14}				.27		
IS_{15}					.24	
IS_{16}	.26					.29
IS_{17}						
IS_{18}	.25	.24				.26
IS_{19}						
IS_{20}						
IS_{21}						
IS_{22}						
IS_{23}						
IS_{24}						
IS_{25}						
IS_{26}						
IS_{27}	.32					.27
$OSIS_A$				.24		.28

*All entries $r > .24$, $p < .05$. Other information: $R_{c1} = .80$, $\Lambda = .04$, $X^2 = 162.0$, $p > .05$ (See Table 21).

TABLE 18
CORRELATION MATRIX:
CORRELATE SET (VALUES) AND CRITERION SET (COMPETENCY)*

Criterion Set	Correlate Set					
	Th	E	A	S	P	R
OS_1						
OS_2						
OS_3						
OS_4						
OS_5				.27		
OS_6						
OS_7						
OS_8				.26		
OS_9						
OS_{10}						
OS_{11}						
OS_{12}						
OS_{13}						
OS_{14}						
IS_{15}						
IS_{16}				.31		
IS_{17}				.31		
IS_{18}						
IS_{19}						
IS_{20}	-.25	-.24				.33
IS_{21}						
IS_{22}						
IS_{23}						
IS_{24}						
IS_{25}						
IS_{26}						
IS_{27}						
$OSIS_A$						

*All entries $\underline{r} > .24$, $\underline{p} < .05$. Other information: $R_{c1} = .81$, $\Lambda = .03$, $\underline{X}^2 = 178.9$, $\underline{p} > .05$ (See Table 22).

TABLE 19
X^2 TESTS OF SUCCESSIVE LATENT ROOTS:
CORRELATIONAL STUDY I

Number of Roots Removed	Largest Latent Root Remaining	Corresponding Canonical R	Λ	X^2	NDF	P
0	.929	.96	.000	772.5	700	< .05
1	.896	.95	.000	666.5	648	> .05
2	.879	.94	.000	575.9	598	> .05
3	.799	.89	.000	491.3	550	> .05
4	.789	.89	.000	427.0	504	> .05
5	.772	.88	.000	364.9	460	> .05
6	.687	.83	.001	305.7	418	> .05
7	.649	.81	.002	259.2	378	> .05
8	.617	.79	.004	217.4	340	> .05
9	.516	.72	.011	179.0	304	> .05
10	.477	.69	.024	149.9	270	> .05
11	.452	.67	.045	124.0	238	> .05
12	.418	.65	.082	99.9	208	> .05
13	.352	.59	.142	78.2	180	> .05
14	.283	.53	.218	60.9	154	> .05
15	.253	.50	.304	47.6	130	> .05
16	.227	.48	.408	35.9	108	> .05
17	.170	.41	.527	25.6	88	> .05
18	.145	.38	.635	18.2	70	> .05
19	.115	.34	.743	11.9	54	> .05
20	.080	.28	.839	7.0	40	> .05
21	.043	.21	.911	3.7	28	> .05
22	.031	.18	.952	2.0	18	> .05
23	.014	.12	.983	0.7	10	> .05
24	.003	.05	.997	0.1	4	> .05

TABLE 20
$\underline{X}^2$ TESTS OF SUCCESSIVE LATENT ROOTS:
CORRELATIONAL STUDY II

Number of Roots Removed	Largest Latent Root Remaining	Corresponding Canonical R	Λ	$\underline{X}^2$	NDF	P
0	.468	.68	.463	39.3	84	> .05
1	.257	.51	.871	7.1	54	> .05

TABLE 21
$\underline{X}^2$ TESTS OF SUCCESSIVE LATENT ROOTS:
CORRELATIONAL STUDY III

Number of Roots Removed	Largest Latent Root Remaining	Corresponding Canonical R	Λ	$\underline{X}^2$	NDF	P
0	.642	.80	.038	162.0	168	> .05
1	.495	.70	.106	111.2	135	> .05
2	.420	.64	.210	77.3	104	> .05
3	.401	.63	.362	50.4	75	> .05
4	.233	.48	.603	25.0	48	> .05
5	.213	.46	.787	11.9	23	> .05

TABLE 22
$\underline{X}^2$ TESTS OF SUCCESSIVE LATENT ROOTS:
CORRELATIONAL STUDY IV

Number of Roots Removed	Largest Latent Root Remaining	Corresponding Canonical R	Λ	$\underline{X}^2$	NDF	P
0	.661	.81	.027	178.9	168	> .05
1	.545	.74	.079	123.3	135	> .05
2	.454	.67	.175	86.4	104	> .05
3	.421	.65	.320	56.4	75	> .05
4	.280	.53	.553	29.3	48	> .05
5	.232	.48	.768	13.1	23	> .05

TABLE 23
CONTRIBUTIONS OF INDIVIDUAL VARIABLES TO SIGNIFICANTLY RELATED CANONICAL VARIATES: CORRELATIONAL STUDY I

Canonical Vectors			
Correlate Set Personality		Criterion Set Competency	
.35	MFCCF	.47	OS_7
.25	HPA	.44	IS_{25}
.22	P	.38	OS_9
.18	S_2	.37	IS_{26}
.18	FCM	.34	OS_{14}
.18	FSFch	.30	OS_1
.16	$F-F_1$	.26	OS_{10}
.09	FM	.25	IS_{19}
.09	CFFC	.25	IS_{16}
.07	WM	.25	OS_5
.06	Fch	.22	OS_2
.06	D	.20	IS_{15}
.00	FMFCM	.20	OS_{12}
-.04	$F-F_2$	.19	IS_{20}
-.08	S_1	.19	OS_3
-.11	O	.17	IS_{21}
-.12	FMM	.15	IS_{23}
-.13	Dd	.13	OS_{11}
-.21	OP	.13	IS_{18}
-.21	H	.13	IS_{17}
-.24	DM	.12	IS_{24}

TABLE 23 (Continued)
CONTRIBUTIONS OF INDIVIDUAL VARIABLES TO SIGNIFICANTLY RELATED CANONICAL VARIATES: CORRELATIONAL STUDY I

Canonical Vectors	
Correlate Set Personality	Criterion Set Competency
-.25 FMF-FM	.12 OS_8
-.28 M	.06 IS_{27}
-.32 F	.06 OS_6
-.42 W	.05 OS_4
	.03 OS_{13}
	.03 IS_{22}
	-2.36 $OSIS_A$

TABLE 24
CONTRIBUTIONS OF INDIVIDUAL RIGHT-HAND VARIABLES TO UNRELATED CANONICAL VARIATES: CORRELATIONAL STUDIES II, III, AND IV

Canonical Vectors		
Attitude Set	Mental Ability Set	Value Set
.39 F_{III}	.65 Q	.51 A
.27 F_{IV}	.14 V	.46 E
.15 F_I	-.74 T	.40 S
.15 F_{II}		.39 R
.06 F_V		.33 Th
-.85 MTAI		.32 P

APPENDIX B

DEFINITIONS RELATED TO RESEARCH DESIGNS

APPENDIX B

DEFINITIONS RELATED TO THE INSTRUCTIONAL PROJECT'S SIMPLE-RANDOMIZED AND TREATMENTS X LEVELS DESIGNS

In the typical simple-randomized design, the "effect" of a single treatment is the deviation of the treatment group mean from the general mean. If all treatment group means are the same, the observed "effect" of each treatment is zero. Reference to the collective effects of all treatments is also necessary: this "treatments" effect (note the plural) is regarded as corresponding to the mean square for treatments. Again, if all observed treatment means are the same, the observed treatments effect will be zero.

Treatment effects in a treatments X levels design are similar, except it is necessary to distinguish between the effects of a treatment at a given level and its average effect for all levels. An effect of a given treatment at a given level is called a "simple" effect of the treatment. The average effect of the treatment at all levels is called the "main" effect of the treatment. A simple effect of a given treatment is associated with the deviation of the corresponding treatment subgroup mean from the mean for its level. In a double-entry table a simple effect is associated with the deviation of the related cell mean from the row mean. The main effect of a treatment is associated with the deviation of the treatment mean from the general mean. The main effect of a treatment is thus the weighted average of all its simple effects. In accordance with the preceding definitions, the main effect of any one of the five major experiments was associated with the mean square for treatments, while a simple effect of treatments was computed only for the data from the given level.

APPENDIX C

T SCORE EQUIVALENTS

APPENDIX C
T SCORE EQUIVALENTS FOR EACH FIVE-POINT INSTROTEACH RATING SCALE

Scales	T Score Equivalents of Five-Point Rating Scales				
	1	2	3	4	5
1	26	36	44	53	63
2	31	37	44	53	64
3	29	33	38	50	63
4	33	38	45	54	65
5	38	43	49	59	60
6	35	46	54	61	62
7	24	32	41	49	59
8	31	35	40	50	61
9	33	40	47	57	69
10	34	42	49	58	70
11	35	44	51	59	69
12	30	36	44	53	63
13	35	42	49	57	65
14	32	40	47	56	67
15	40	48	54	60	67
16	32	40	48	58	70
17	35	45	52	58	68
18	37	43	48	55	63
19	41	49	51	57	68
20	24	32	39	45	56
21	36	46	52	58	66
22	41	48	54	63	69
23	33	41	48	55	62
24	33	42	49	55	62
25	32	39	45	52	62
26	35	42	47	52	65
27	31	36	43	53	66

APPENDIX D*

INSTROTEACH SCALES

*The twenty-seven INSTROTEACH scales in this appendix are from the INSTROTEACH workshop manual, The Evaluation of Teaching Effectiveness in the Church, Copyright, 1970, The INSTROTEACH Board. This material is used by permission and is not to be reproduced in any form.

INSTROTEACH, PART I (OBSERVATION SCALES)*

SCALE 1. USE OF MATERIALS IN TEACHING

The teacher:

5. Makes effective use of a wide variety of well-selected materials provided by the church and by his own initiative.

4. Makes effective use of a few additional materials as well as those provided by the church.

3. Makes good use of materials provided by the church.

2. Makes limited use of the more common materials provided by the church.

1. Makes ineffective or no use of materials provided by the church.

SCALE 2. OPPORTUNITY FOR STUDENT PARTICIPATION

The teacher:

5. Provides students with frequent opportunity to participate in and to lead classroom activities; encourages interaction.

4. Provides students with opportunity to interact and participate in classroom activities.

3. Provides students with the opportunity to respond in teacher-led classroom activities, with limited interaction.

2. Provides students with the opportunity to participate when called upon.

1. Provides students with limited opportunity to respond; lectures most of the time.

SCALE 3. ATTITUDE TOWARD OPINION

The teacher:

5. Demonstrates openness to student opinion, effectively eliciting expressions of differing views.

4. Shows openness to student opinion; permits expression of differing views.

3. Permits expressions of student opinion within limits.

2. Shows little regard for student opinion.

1. Discourages expressions of student opinion.

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*Note: In their published form, these scales are scrambled and items identified as A through E in each instance.

SCALE 4. CLASSROOM CONTROL

The teacher:

5. Enlists student cooperation in consistently maintaining an atmosphere of purposeful self-regulation.

4. Enlists student cooperation in developing an atmosphere of self-regulation; must impose control occasionally.

3. Maintains classroom control; provides standards of conduct that are generally accepted by the students.

2. Imposes classroom control frequently to maintain order.

1. Makes little attempt to maintain classroom control; allows student conduct that interferes with learning activities.

SCALE 5. DEVELOPING THE PHYSICAL ENVIRONMENT

The teacher:

5. Has shared with students in planning and arranging a setting that relates to current objectives and provides for maximum learning.

4. Has developed a setting that fosters learning, relates to current objectives, and suggests some evidence of student involvement.

3. Has developed a setting that fosters learning and is related to objectives.

2. Has modified the setting without reference to objectives.

1. Has made little or no modification in the setting.

SCALE 6. TEACHER-STUDENT PLANNING

The teacher:

5. Shares goals and develops cooperatively with students appropriate curriculum plans for individual and group activities pertinent to their interests, needs, and abilities.

4. Shares goals with students and makes appropriate curriculum plans for individual and group activities, with some student participation.

3. Develops curriculum plans for individual and group activities based on goals; provides limited opportunity for student participation in planning.

2. Plans learning sessions based on goals with little or no opportunity for student participation in planning.

1. Plans learning sessions independently with limited relation to goals.

SCALE 7. TEACHER PREPARATION FOR CLASSROOM SESSION

The teacher, with respect to subject matter preparation:

5. Demonstrates thoroughness and resourcefulness in preparation.

4. Demonstrates adequate preparation; makes occasional enrichment application.

3. Evidences sufficient preparation to cope with ordinary class situations.

2. Shows limited preparation; refers often to printed content.

1. Evidences inadequate preparation; is inaccurate.

SCALE 8. VARIETY IN LEARNING ACTIVITIES

The teacher:

5. Utilizes a wide variety of learning activities, appropriate for the educational aims and engaging all students.

4. Provides opportunity for a variety of learning activities, appropriate for the educational aims and engaging most students.

3. Provides a limited variety of learning activities somewhat related to aims and engaging some students.

2. Provides little or no variety of learning activities in the classroom except those related to special events.

1. Utilizes a single learning procedure.

SCALE 9. RELATION OF CHURCH SUBJECT MATTER TO LIFE SITUATIONS

The teacher:

5. Evidences skill and thoroughness in developing student ability to relate subject matter to life situations.

4. Attempts frequently to develop student ability to relate subject matter to life situations.

3. Selects from subject matter points of relevance to life situations with minimal discussion.

2. Stresses subject matter, overlooking most possibilities for relating it to life situations.

1. Makes little connection between subject matter and daily living.

SCALE 10. STUDENT INQUIRY INTO SUBJECT MATTER

The teacher:

5. Facilitates encounter with subject matter by skillfully asking and eliciting questions, directing individual and group procedures, and helping students come to their own conclusions.

4. Encourages students to explore subject matter; uses question-and-answer procedure; elicits student questions; guides students to conclusions.

3. Presents subject matter; uses question-and-answer procedures; occasionally invites student questions.

2. Presents subject matter and frequently states his own conclusions; uses teacher-initiated question-and-answer procedures with individual students.

1. Presents information to be accepted uncritically; stifles student curiosity.

SCALE 11. RECOGNITION OF LEARNING DIFFICULTIES

The teacher:

5. Identifies learning difficulties skillfully; provides effective individual and group instruction.

4. Identifies most cases of learning difficulty; provides individual and group instruction.

3. Identifies general learning difficulties; provides group instruction accordingly.

2. Identifies obvious learning difficulties; provides some help.

1. Disregards learning difficulties.

SCALE 12. SOCIAL CLIMATE

The students:

5. Evidence a spirit of cooperation and mutual interest resulting in high morale.

4. Evidence a spirit of cooperation and mutual interest, with few exceptions.

3. Show consideration for others, only occasionally requiring teacher intervention to achieve it.

2. Evidence apathy and lack of interest in one another's opinions and activities.

1. Evidence acts of rejection and/or antagonism among members of the group.

SCALE 13. CLASSROOM ACTIVITIES TO ENCOURAGE CHRISTIAN ACTION

The teacher:

5. Identifies personal and social problems skillfully and designs effective classroom activities to encourage Christian action.

4. Identifies most personal and social problems and designs some classroom activities to encourage Christian action.

3. Identifies major personal and social problems and indicates their relationship to Christian convictions.

2. Indicates minimal awareness of social problems and ineffectively relates them to Christian convictions.

1. Indicates minimal awareness of social problems and ineffectively relates them to Christian convictions.

SCALE 14. DEVELOPING STUDENT SKILLS IN INTERPRETATION OF THE BIBLE

The teacher:

5. Initiates systematic plans and regular activities to develop student skills in interpreting the Bible; utilizes appropriate resources effectively.

4. Utilizes planned activities and resources regularly to develop student skills in interpretation of the Bible.

3. Provides some opportunities for developing skills in interpreting the Bible, with occasional use of resource materials.

2. Provides limited opportunities for students to develop skills in interpreting the Bible.

1. Provides no opportunity for developing skills in interpreting the Bible.

SCALE 15. EVALUATION OF INDIVIDUAL STUDENT PROGRESS

The teacher:

5. Utilizes accepted procedures for evaluating progress of each student and adjusts program accordingly.

4. Makes regular use of accepted procedures in evaluating individual and group progress.

3. Makes periodic use of evaluative procedures for assessing progress of the group.

2. Makes infrequent use of evaluation procedures in general assessment of group progress.

1. Makes no use of evaluation procedures.

SCALE 16. AWARENESS OF PEER RELATIONSHIPS

The teacher:

5. Evidences thorough awareness of peer relationships and consistently takes effective action.

4. Shows awareness of peer relationships and frequently makes appropriate adaptations.

3. Exhibits awareness of peer relationships, limited to the obvious, and modifies procedures accordingly.

2. Shows little awareness of peer relationships as being relevant to learning.

1. Disregards peer relationships as being relevant to learning.

SCALE 17. PERSONAL RELATIONSHIPS WITH INDIVIDUAL STUDENTS

The students:

5. Seek out this teacher frequently for counsel on both personal and subject matter problems.

4. Seek out this teacher occasionally for counsel on personal and subject matter problems.

3. Seek out this teacher for counsel on subject matter problems; seldom seek out this teacher with personal problems.

2. Seek out this teacher rarely for counsel.

1. Avoid contacts with this teacher.

SCALE 18. DEVELOPMENT OF STUDENT SELF-CONCEPT

The teacher:

5. Encourages and assists each student to develop a positive self-image.

4. Accepts each student as an individual in his own right.

3. Encourages most students to develop an awareness of self-worth.

2. Accepts students as individuals, but is more concerned with subject matter.

1. Is concerned primarily with subject matter.

SCALE 19. COOPERATION WITH PROFESSIONAL CHURCH STAFF IN COUNSELING PROBLEMS

The teacher:

5. Recognizes student problems and skillfully determines cases for referral to appropriate professional church staff member; cooperates effectively in suggested procedures.

4. Recognizes student problems, refers them to professional church staff, and cooperates as requested.

3. Recognizes most student problems and seeks staff aid; lacks skill in following suggested procedures.

2. Recognizes obvious student problems, refers them to the professional staff, and assumes no further responsibility.

1. Recognizes obvious student problems, but fails to request counseling assistance.

SCALE 20. PARTICIPATION IN LIFE OF THE CHURCH

The teacher:

5. Evidences regular and knowledgeable participation in the total life and worship of the church.

4. Attends worship regularly; shows appreciable understanding of the church's activities.

3. Participates to a limited degree in worship and church activities.

2. Seldom attends worship; shows some acquaintance with the church's activities.

1. Never attends worship; shows little or no knowledge of what the church is doing.

SCALE 21. PARENT ORIENTATION TO CHURCH EDUCATION

The teacher:

5. Assumes responsibility for cultivating parental interest in church education; assists in developing effective orientation procedures.

4. Cultivates parental interest in church education; participates in parent orientation programs.

3. Encourages parents to attend orientation programs; occasionally initiates discussion with parents.

2. Discusses church education with parents who express interest; takes no initiative in parent orientation.

1. Disregards parental interest in church's educational program.

SCALE 22. USE OF COMMUNITY RESOURCES

The teacher:

5. Analyzes and uses a variety of community resources systematically, relating them skillfully to the learning activities.

4. Utilizes community resources frequently in relation to learning activities.

3. Uses some community resources in relation to classroom activities.

2. Uses some resource persons without relation to session plans.

1. Uses no community resources in relation to classroom activities.

SCALE 23. COMMUNITY INVOLVEMENT

The teacher:

5. Participates effectively as an individual and as a member of the church in the study and solution of community problems.

4. Participates in church programs designed to solve community problems; often acts individually.

3. Demonstrates awareness of major community problems; occasionally participates in their solution, as an individual.

2. Shows little awareness of community problems and lacks interest in the church's involvement.

1. Expresses opposition to church involvement in community problems; resists involvement personally.

SCALE 24. PROGRAM OF PERSONAL STUDY

The teacher:

5. Studies teaching materials and the Bible systematically and keeps informed regarding theology, the church, and current affairs in a planned study program.

4. Studies teaching materials and the Bible regularly and reads widely about the church and current affairs, but lacks a planned study program.

3. Studies teaching materials and the Bible regularly and reads some additional articles; lacks study program.

2. Reads teaching materials for each learning session; reads the Bible and denominational publications occasionally.

1. Reads only necessary teaching materials; engages in no reading beyond minimal preparation for teaching.

SCALE 25. RELATION OF CLASSROOM PROGRAM TO OVER-ALL AIMS OF PARISH EDUCATION

The teacher:

5. Demonstrates familiarity with the over-all aims of parish education and develops classroom programs consistent with these aims.

4. Makes a conscious effort to understand the aims of parish education and to plan teaching in relation to them.

3. Accepts the aims of parish education and usually develops unit plans accordingly.

2. Shows limited understanding of the aims of parish education; plans teaching program independently.

1. Rejects the aims of parish education and resists suggestions for changing programs to be consistent with them.

SCALE 26. PARTICIPATION IN STAFF PLANNING

The teacher:

5. Participates creatively and cooperatively, making effective contributions in staff planning.

4. Participates regularly in staff planning and makes frequent contributions.

3. Participates routinely in staff planning sessions.

2. Attends staff planning sessions occasionally.

1. Shows little inclination to attend staff planning sessions.

SCALE 27. RESPONSIBILITY FOR IMPROVEMENT OF TEACHING SKILL

The teacher:

5. Develops consistently effective classroom procedures as a result of a planned program of reading and frequent participation in local and regional teacher education events.

4. Upgrades classroom procedures as a result of reading and attendance at available teacher education events.

3. Modifies classroom procedures occasionally as a result of attending meetings on improved teaching practices.

2. Demonstrates little interest in improving classroom procedures; seldom attends available training opportunities.

1. Shows no interest in improving classroom procedures.

APPENDIX E

LEFT-HAND COMPONENTS FOR CORRELATIONAL STUDIES

APPENDIX E

LEFT-HAND COMPONENTS FOR CORRELATIONAL STUDIES I, II, III, AND IV: THE CRITERION SET

(Scores based on observer ratings of subjects on the INSTROTEACH)

OS_1	Use of materials in teaching
OS_2	Opportunity for student participation
OS_3	Attitude toward opinion
OS_4	Classroom control
OS_5	Developing the physical environment
OS_6	Teacher-student planning
OS_7	Teacher preparation for classroom session
OS_8	Variety in learning activities
OS_9	Relation of church subject matter to life situations
OS_{10}	Student inquiry into subject matter
OS_{11}	Recognition of learning difficulties
OS_{12}	Social climate
OS_{13}	Classroom activities to encourage Christian action
OS_{14}	Developing student skills in interpretation of the Bible
IS_{15}	Evaluation of individual student progress
IS_{16}	Awareness of peer relationships
IS_{17}	Personal relationships with individual students
IS_{18}	Development of student self-concept
IS_{19}	Cooperation with professional church staff in counseling problems
IS_{20}	Participation in life of the church
IS_{21}	Parent orientation to church education
IS_{22}	Use of community resources
IS_{23}	Community involvement
IS_{24}	Program of personal study
IS_{25}	Relation of classroom program to over-all aims of parish education
IS_{26}	Participation in staff planning
IS_{27}	Responsibility for improvement of teaching skill
$OSIS_A$	Aggregate competency score

APPENDIX F

RIGHT-HAND COMPONENTS FOR CORRELATIONAL STUDY I

APPENDIX F

RIGHT-HAND COMPONENTS FOR CORRELATION STUDY I: CORRELATE SET I (Scores based on responses to the Structured-Objective Rorschach Test)

W	Theoretical
D	Practical
Dd	Pedantic
WM	Induction
DM	Deduction
S_1	Rigidity
F	Structuring
$F-F_1$	Concentration
HPA	Range
H	Human relationships
P	Popular
O	Original
S_2	Persistence
FM	Aggressiveness
FCM	Social responsibility
CFFC	Cooperation
FMFCM	Tact
FMM	Confidence
FSFch	Consistency
Fch	Anxiety
FMF-FM	Moodiness
M	Activity potential
$F-F_2$	Impulsiveness
MFCCF	Flexibility
OP	Conformity

APPENDIX G

RIGHT-HAND COMPONENTS FOR CORRELATIONAL STUDIES

APPENDIX G

RIGHT-HAND COMPONENTS FOR CORRELATIONAL STUDIES II, III, AND IV: THE CORRELATE SETS

Correlate Set Two

(Scores based on responses to the Henmon-Nelson Tests of Mental Ability)

Q	Quantitative Mental Ability
V	Verbal Mental Ability
T	Total (composite) mental ability

Correlate Set Three

(Scores based on responses to the MTAI)

F_I	Beliefs about classroom control
F_{II}	Opinions about children
F_{III}	Tolerance toward children's misbehavior
F_{IV}	Empathy toward children
F_V	Laissez faire vs. strong control of student behavior
MTAI	Total measure of teacher attitude

Correlate Set Four

(Scores based on responses to the Study of Values)

Th	Theoretical values
E	Economic values
A	Aesthetic values
S	Social values
P	Political values
R	Religious values

APPENDIX H

DEFINITIONS OF S/O RORSCHACH ATTRIBUTES

APPENDIX H

DEFINITIONS OF ATTRIBUTES: S-O RORSCHACH TEST

Scores in Mental Functioning and Temperament factors are expressions of the degree of the factor relative to scores generally distributed in the population. That is, high scores and those above average do not imply a degree that is "good," "bad," "healthy," or "advantageous." A high score simply indicates that the examinee has made more responses than the typical individual to a particular variable. The evaluative interpretation (high or low) depends upon the nature of the factor and its contribution to the individual's life.

MENTAL FUNCTIONING

Intellectual level does not necessarily reflect intellectual performance. It is desirable to know such features as the type of approach to intellectual situations used, adaptability to the reasoning processes, flexibility of ideas, and ability to organize (structure) mental processes.

(W) Theoretical: (the facility for visualizing the overall picture); for thinking in broad, general, or abstract terms; facility for getting perspective, visualizing the overall picture, and seeing relationships between the parts.

(D) Practical: (tendency for thinking or attacking problems on the basis of concrete details); tendency for thinking or attacking problems on the basis of practical, concrete, or very definite details.

(Dd) Pedantic: (preference for thinking and attacking problems on the basis of concrete details; preference for thinking and attacking problems from the standpoint of fine, minute details); tendency to be perfectionistic and to focus on precise, sometimes trivial details.

(WM) Induction: (facility for logical thinking based upon inferences); utilization of their accumulative synthesis to lead to conclusions, principles, or generalizations; ability to organize details into a meaningful whole.

(DM) Deduction: (readiness to employ the logical approach in which established principles are applied to data, for the purpose of analyzing their relationships to one another - and to the principle probably involved). A balance between facilities for inductive and deductive thinking, especially when both are high, would point toward a mental adaptiveness or "efficiency" wherein such intellectual potential as the individual has is the more effective because of versatility in logical processes.

(S_1) Rigidity: (tendency toward dogmatic or fixed ideas). Higher scores suggest an unwillingness to change a point of view in spite of evidence to the contrary; low scores suggest an uncritical acceptance of others' viewpoints.

(F) Structuring: (facility for mental alertness and precision in perceiving reality).

($F\text{-}F_1$) Concentration: (capacity for attending to the task) or for avoiding distractions from one's environment or from one's own extraneous thoughts.

INTERESTS

These facets of behavior refer to the range of reactions to perceptual experience. Sensitivity to a variety of kinds of percepts implies a broader range of interests than does a paucity of percept-types.

(HPA) Range: (the tendency of interests to be expansive or narrow and confined).

(H) Human Relations: (the disposition toward perception of elements having human connotations).

RESPONSIVENESS

Two frames of reference are involved here. The first derives from the modality of responses, the second from the frequency of responses. It is assumed that responses to items most frequently seen by the majority of the normative group are indicative of conformity. Conversely, consistent selection of rarely observed items implies a disposition toward uniqueness.

(P) Popular: Tendency to perceive the same features in the same way as others; to see things as other persons do; empathic tendencies.

(O) Original: Disposition to perceive the unique, the different, and the nonconforming, perhaps even the eccentric; emphasis on individualism of actions.

TEMPERAMENT

The attributes listed under this heading relate largely to deep inner feeling, for which there often are compensations in outwardly observed behavior. Many of the compensations can become occupational advantages.

(S_2) Persistence: (the determination not to deviate from a set course). It may appear as doggedness or stick-to-itiveness. It can range from inability to stick to or complete a task along to the further extreme of stubbornness, defiance, or contentiousness.

(FM) Aggressiveness: The aspiration toward goals by means of well-accepted and morally developed procedures; willingness and desire to work; sense of a mature self-control with social conformity.

(FCM) Social Responsibility: (willingness to subserve oneself even though no personal gains are evident); energetic acceptance of one's obligations to himself, to his family, and to society.

(CFFC) Cooperation: (willingness to use a teamwork approach); sensitivity toward others in combination with appreciation and responsiveness to human relationships. Willingness to submerge one's immediate needs to the long-range interests of other persons is implied.

(FMFCM) Tact: (control of impulses and biases); maturity expressed in the ability to maintain a stable relationship with superiors, peers, and inferiors. There is balance between inner impulses, conscious self-control, and demands of the social environment.

(FMM) Confidence: (inner feelings of prestige); ego-strength, self-confidence morale; inner feelings of prestige or personal worth, ranging from feelings of inferiority to strong feelings of self-assurance. It implies ability to withstand stresses and strains and to maintain feelings of self-worth (prestige) in the face of adversity.

(FSFch) Consistency of Behavior: Predictability of actions; tendency for characteristic behavior patterns to be stable and well-established.

(Fch) Anxiety: Generalized apprehensiveness, uneasiness, or internal disquietude; self-concern and preoccupation with personal well-being, feelings, emotions, and sensations, resulting from a feeling of insecurity. A low anxiety score indicates composure; however, excessive composure, or almost complete absence of anxiety, may indicate a tendency to smother feelings to the point of seeming cold and insensitive. Anxiety may reflect itself in feelings of insecurity, expressions of inadequacy, or construction of behavior; it may also reflect itself in erratic behavior.

(FMF-FM) Moodiness: Sharp fluctuations in mood, ranging from elation to depression. The intensity and duration of either phase may vary greatly.

(M) Activity Potential: Control of emotional energy; energy endowment; capacity to follow through on a planned course of action; concentration of energies in a given direction, as opposed to dissipation of strength in non-productive channels.

(F-F_2) Impulsiveness: Tendency to act upon impulse rather than on the basis of a considered plan; reflected in spur-of-the-moment decisions.

(MFCCF) Flexibility: Adaptability; faculty for accepting and handling most life situations in a mature manner; capacity to adjust readily from one type of situation to another.

(OP) Conformity: Tendency to accept and be directed by the socially accepted codes, customs, and mores.

APPENDIX I

PSYCHOMETRIC REPORTS:

CRITERION AND CORRELATE INSTRUMENTS

THE ALLPORT-VERNON-LINDZEY STUDY OF VALUES

The Study of Values[1] first appeared in 1931 as an attempt to measure personality traits postulated by Eduard Spranger in his Types of Men.[2] The test was revised in 1951 and again in 1960. The primary aims of the test were to measure the relative prominence of six basic interests or motives in personality: theoretical, economic, aesthetic, social, political, and religious.

The test consisted of forty-five questions; the first thirty were paired comparisons and the last fifteen were four-part multiple choice, making one hundred-twenty alternatives in all. The choices offered represent a selection of one of the six types of values and the sum of the examinee's choices of any one kind constituted his score for that type of value. The scale used is an ipsative one causing a higher score on one part to cause automatically a lower one on another part. The test required from twenty to forty minutes to complete, the time dependent upon the verbal ability of the examinee.

The 1951 revision attempted to improve the diagnostic power of the items, simplify and modernize wording of items, revise the scoring system, and increase the reliability of the test. The 1960 revision made no changes in the test items presented in the 1951 edition. Only changes in the score sheet (correction figures) were made as the result of enlarged and improved norms. Changes in parts 3, 5, and 6 of the manual also resulted.

The test was a difficult one and was, therefore, more suitable for superior high school students or college students.[3] It has been shown that

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[1]Gordon W. Allport, Philip E. Vernon, and Gardner Lindzey, Study of Values (Boston: Houghton-Mifflin Company, 1931, 1951, 1960).

[2]Eduard Spranger, Types of Men (Halle: Max Niemeyer Verla, 1928).

[3]Gordon W. Allport, Philip E. Vernon, and Gardner Lindzey, Study of Values: Manual of Directions (Boston: Houghton-Mifflin Company, 1960), p. 3.

the test has a vocabulary grade placement of 11.3.[4] The test seemed to have more applicability as an instrument for research in the theory and organization of personality rather than as a practical aid in counseling or selection. Furthermore, because of the use of Spranger's configurations, no allowance was made for hedonistic philosophies or valueless personalities.

Reliability of the "Study of Values"

The authors reported in the Manual of Directions that the split-half reliability of the 1951 test had a mean reliability coefficient of .90, with coefficients ranging from .84 to .95. They further reported that an item analysis of 780 college students of both sexes from six different colleges revealed that each "theoretical" item was positively associated with the total score derived from all the "theoretical" items and that the items for each of the other values likewise held together consistently. The final item analysis showed a positive correlation for each item with the total score for its value significant at the .01 level of confidence.[5]

The authors also indicated that in test-retest reliability, using the 1951 edition with a one-month interval, a mean repeat reliability coefficient of .89 was obtained for a group of thirty-four cases. With a two-month span and fifty-three cases, a mean repeat reliability coefficient of .88 was obtained.[6]

Validity of the "Study of Values"

The Study of Values test has been related to many variables which can be found in college populations and to relatively few in other populations.

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[4]Donald E. Super, Appraising Vocational Fitness (New York: Harper and Brothers, 1962), p. 493.

[5]Allport, Vernon, and Lindzey, op. cit., p. 9.

[6]Ibid., p. 10.

Duffy and Crissy,[7] in a study of students at Sarah Lawrence College, using freshman academic achievement as their criterion, found a validity of .34 for a combination of value scores. Theoretical and aesthetic values had positive correlations and economic and political values had negative correlations.

Pintner[8] correlated intelligence test scores of fifty-three graduate students with value scores and obtained correlations of .24 with theoretical, .38 with social, -.28 with political, and -.41 with economic values; the others being practically zero.

Schaefer,[9] using fifty-one female sophomores at Reed College, used the Cooperative Test of General Culture as a criterion and found correlations of .58 and -.47 between literary achievement and aesthetic and economic values; .47 and -.28 between fine arts and aesthetic and economic values; .37 and -.37 between history and aesthetic and economic values; and .31 between general science and theoretical value.

Mawradi[10] found at Wellesley that the test given in college was highly predictive of occupational careers five to fifteen years after graduation from college.

Numerous statements have been made concerning the worth of the Allport-Vernon-Lindzey Study of Values and the following seemed the most representative:

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[7]E. Duffy and W. Crissy, "Evaluative Artitudes as Related to Vocational Interest and Academic Achievement," Journal of Abnormal and Social Psychology, 28:259-273, 1933.

[8]R. Pintner, "Comparisons of Interest, Abilities, and Attitudes," Journal of Abnormal and Social Psychology, 30:419-422, 1936.

[9]B. R. Schaefer, "The Validity and Utility of the Allport-Vernon Study of Values Test," Journal of Abnormal and Social Psychology, 30:419-422, 1936.

[10]Allport, Vernon, and Lindzey, op. cit., Manual of Directions, p. 15.

Handleby related: In summary, with college or college graduate populations where concern is with dimensions of interest and value ... the Study of Values is quite likely to prove a helpful tool.[11]

Super stated: The traits measured ... are best described as values or evaluative attitudes, although some of them verge on needs. We have seen that they closely resemble interests and are perhaps correctly described as more basic, for they concern the valuation of all types of activities and goals, and they seem in some instances to be more closely related to needs or drives. The Allport-Vernon-Lindzey is by no means the only values test, but the first of its kind, has been the most thoroughly studied, and is still the most widely used.[12]

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[11]J. D. Handleby, A Review of the Allport-Vernon-Lindzey, Study of Values, Oscar K. Buros, Editor, The Sixth Mental Measurements Yearbook (New Jersey: The Gryphon Press, 1965), p. 182.

[12]Super, op. cit., p. 492.

THE HENMON-NELSON TEST OF MENTAL ABILITY

This instrument was designed to measure those aspects of mental ability which the authors considered important for success in academic work and in similar endeavors outside the classroom. The college-level tests (Form A) were used. This instrument contained one hundred items arranged in order of increasing difficulty, and the difficulty of items was designed so that the test was suitable for use with students from the freshman year of college through the first year of graduate school. Quantitative and verbal scores were obtained as well as total scores over both factors. Sixty per cent of the test items represented the verbal factor, and the remaining 40 per cent represented the quantitative factor.

Reliability

Odd-even reliability coefficients were obtained from papers selected at random from the norms' group, and the authors of the tests reported the following values: .92 (quantitative); .92 (verbal); and .95 (total). The odd-even method of computing correlations and thus determining reliability coefficients was considered suitable for tests of "power," but such a procedure allowed something to be desired for tests in which speed weighs heavily in determining an individual's score. The authors, therefore, provided additional reliability data by administering Form A and Form B to the same individuals in order to determine an alternate-forms' reliability. The results indicated alternate-forms' reliability coefficients of .84 (Q), .87 (V), and .88 (T).[1]

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[1]Sidney A. Henmon, and M. J. Nelson, The Henmon-Nelson Tests of Mental Ability (Form A) (Boston: Houghton Mifflin Company, 1961).

Validity

There were no direct methods of determining the validity of the Henmon-Nelson Tests of Mental Ability, but there were a number of ways in which validity was judged with some degree of objectivity. In those cases, validity was indicated by comparisons with (1) other accepted indicators of the same function, (2) admissions and guidance data at the college level, (3) other tests which have proved useful in sectioning, and (4) evidence of useful relationships between test scores and subsequent grades in college. Validity studies which have been made by the authors indicated that, in correlations between Henmon-Nelson college level test scores and freshman first semester grade point averages, predictive validity was justified: .46 (Q), .47 (V), .54 (T). Congruent validity was established by correlations between the Henmon-Nelson college level test and the Nelson-Denny Reading Test, producing correlations of .41 (Q), .77 (V) and .78 (T).[2]

[2] Ibid.

THE MINNESOTA TEACHER ATTITUDE INVENTORY (MTAI)

The Minnesota Teacher Attitude Inventory was developed from a dissertation completed by Leeds in 1946 and later more fully presented in a 1950 monograph. In the words of the authors, it was designed:

> ...to measure those attitudes of a teacher which predict how well he will get along with pupils in interpersonal relationships, and indirectly how well satisfied he will be with teaching as a vocation.[1]

Original construction was from 378 opinion-like statements representing teacher reactions to children. These were rewritten into two forms, one positive and one negative, thus establishing a pool of 700 items. The validation was of a purely empirical form, defined as the degree to which each item would discriminate between those teachers having desired and those having undesired relationships with pupils. Two criterion groups were established by having seventy principals in Pennsylvania select 100 superior and 100 inferior teachers. These groups completed two forms of about 380 items, a month apart. The extent to which the items discriminated between the two groups determined the final selection of 150 items.

Validity and Reliability of the MTAI

The second phase was to determine if the inventory as a whole differentiated among a random sample of teachers. One hundred teachers took the MTAI and scores were correlated with scores based on three criteria of teacher-pupil rapport: (1) rating of teachers by pupils, (2) classroom rating of teachers by expert evaluators, and (3) ratings of teachers by principals. The correlations between all three were significant at the .01 level. A combination gave validity coefficient of .594, the split half

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[1]Cook, Walter W., Carroll H. Leeds, and Robert Callis, Manual: Minnesota Teacher Attitude Inventory (New York: The Psychological Corporation, 1951), p. 3.

reliability was .909 (Spearman-Brown).[2] Commenting upon this phase of the development, Cronbach observed that the instrument was probably as well designed and executed as an actuarial test could be.[3]

Later studies refined the relationships between MTAI scores and factors such as age, training, and experience. The results of this research led to intensive use of the inventory with student teachers as a device for predicting teaching success and as an indicator of special personal characteristics. Widespread usage of the inventory was indicated by the volume of research in which its results were reported. In 1953 Buros listed nine references,[4] ten years later fifty reports were listed by Getzels and Jackson, and in 1964 Buros indicated the number had risen to 155.[5] It was reported by LeFevre that the MTAI continued to be utilized in most studies dealing with attitudes toward teaching and children.[6]

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[2] Ibid., pp. 10-12.

[3] Oscar K. Buros (ed.), The Fourth Mental Measurements Yearbook (Highland Park, New Jersey: The Gryphon Press, 1953), p. 801.

[4] Ibid.

[5] Oscar K. Buros (ed.), The Sixth Mental Measurements Yearbook (Highland Park, New Jersey: The Gryphon Press, 1965), pp. 698-700.

[6] Carol LeFevre, "Teacher Characteristics and Careers," Review of Educational Research, XXXVII (October, 1967), p. 434.

THE STRUCTURED-OBJECTIVE RORSCHACH TEST (SORT)

The Structured-Objective Rorschach Test (SORT), employed in the present study, was a modified form of the traditional Rorschach Test. It was described by its author, Joics B. Stone, as "...a radical modification of the traditional Rorschach Test."[1] Although it used the same blots, scoring system, and interpretative rationale of the Rorschach test, the SORT differed in that it provided multiple-choice responses for each blot, with no inquiry conducted. Instead it suggested responses and required a fixed number of total responses. These features of SORT permitted: (1) group administration and/or self-administration, (2) objective scoring, (3) objective standardization, (4) comprehensive norming, and (5) objective and simplified interpretation.

Reliability of the SORT

The instrument seems to possess properties which are highly desirable for a research tool designed for a large scale investigation. The SORT has test-retest reliability coefficients at least equivalent to, and possibly higher than, those of similar tests. The authors report a median coefficient of .75 with a minimum value of .62.

Validity and Related Studies of the SORT

The SORT made no claim as to its value for clinical diagnosis of deviant behavior, but did propose to "appraise and analyze vocationally significant temperament traits of the individual"[2] and "to obtain a measure

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[1] Joics B. Stone, S-O Rorschach Test Manual (Los Angeles: California Test Bureau, 1958), p. 2.

[2] Ibid., p. 3.

of personality or temperament patterns that would be meaningful in vocational counseling and employee selection."[3]

As mentioned above, responses were suggested in the SORT. As an example, for each Rorschach card there were ten triads of items. A triad consisted of three short items, such as Airplane--Elk's Horns--Anvil. The subject was instructed to choose the item which most nearly represented the card or some part of it as he saw it. Hence the subject made ten responses to each card, or one hundred responses to the complete series of ten cards.

The SORT manual provided for scoring of S's responses in terms of normalized standard scores, which were then entered in abacs or systematized tables to place him in one of five rating categories: High, Above Average, Average, Below Average, and Low. This rating placement was obtained for each of twenty-six Rorschach factors, classified under four main headings: (1) Mental Functioning, (2) Interests, (3) Responsiveness, and (4) Temperament. SORT was the instrument employed to assess personality traits in the present investigation.

Lew and Norton utilized SORT in attempting to determine whether personality variables could be found to differentiate between high and low achievers. Of the thirteen temperament measures, only the "persistent" factor differentiated between two groups at the 5 per cent level of confidence with the lower achievers more persistent. The interest factor, "human relationships," differentiated between the two groups at the 1 per cent level of confidence, with the low achievers scoring higher on the "disposition toward the perception of and the attention to elements having human connotation." Of the eight "mental functioning" factors, only "rigidity" separated the two groups at as much as the 5 per cent level. The

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[3]Ibid., p. 4.

"flexibility" scale did not vary for the two groups. Likewise, the five measures of "reduction in efficiency" of "mental functioning" did not differ for the low and high achievers.[4]

Angelino and Hall, in testing for temperament factors with SORT in high and low achieving high school seniors, also found that high achievers were less rigid and more tactful than low achievers. Controls were established for CA, IQ, grades in school, and absence from school.[5]

Hicks and Stone evaluated the effectiveness of a test battery in discriminating between successful and unsuccessful managers. A comprehensive battery was administered to seventy-six supervisors of an autonomous, medium-sized operating division. Results from the Guilford-Zimmerman Aptitude Survey, California Test of Mental Maturity, and Structured-Objective Rorschach Test were related to ratings of overall performance, promotability, and versatility by peers and superiors. The test battery showed significant correlations with peer ratings in all three of these areas (.46-.68), but showed a significant correlation (.44) only with the supervisors' evaluation of versatility. The SORT proved to be the most effective test in the battery, according to the writers.[6]

Chansky measured personality factors of teachers related to the appeal of certain report cards. Some attributes like pedantic thinking and empathy were related slightly to preferences. Inductive reasoning, facility for mental alertness, range of interests, mature aggression (aspiration

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[4]D. H. Low and J. L. Norton, "SORT as a Differentiator between High and Low Achievers," Journal of Counseling Psychologist, IX (Summer, 1962), 185.

[5]Henry Angelino and Richard L. Hall, "Temperament Factors in High and Low Achieving High School Seniors," Psychological Report, VII (December, 1960), 518.

[6]J. A. Hicks and J. B. Stone, "Identification of Traits Related to Managerial Success," Journal of Applied Psychology, XLVI (December, 1962), 428-32.

toward goals by socially acceptable procedures), and self-esteem were markedly related to preference of one type of report card. Highly related to another choice were mental rigidity, persistence, and freedom from anxiety.[7]

Hampton found SORT "to be a good guide in selecting supervisors and easily administered in groups." This researcher also determined that the test could be utilized as a check on the temperament of the subject as revealed by the Guilford-Zimmerman Temperament Survey. Responses to the SORT were more difficult to bias toward social acceptance than responses to the statements on the former test. Hence, according to Hampton, results on the SORT promised to enhance the personnel department's predictive knowledge of a supervisory candidate's personality and temperament.[8]

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[7]N. M. Chansky, "Report Cards and Teacher Personality," Journal of Educational Research, LVII (May, 1964), 492-94.

[8]Peter J. Hampton, "Use of the Rorschach Test in Selecting Factory Supervisors," Personnel Journal, XXXIX (January, 1960), 46-48.

THE TEST ON CHURCH EDUCATION (TOCE)

The Test on Church Education was developed primarily by the Director of the PACE project and others at the request of the evaluation team, because a thorough search of the literature did not reveal an adequate cognitive protocol which suited the needs of the evaluators. More particularly, a test was needed to plumb the subjects' knowledge of factors dealing with church education and pedagogy.

Construction and Item Reduction

The test originally consisted of two hundred items classified unequivalently into five general pedagogical areas. These areas were categorized as follows: (1) Role of the Teacher, (2) The Student, (3) Curriculum Matters, (4) Methods and Techniques, and (5) Social Policy.

The two hundred item pool was then administered to a group of church school teachers (N=65) and the items were then reduced to a pool of fifty-two items. The fifty-two items were then administered to two groups of church school teachers (N=65 and N=56) and further reduced to a pool of fifty items. And finally, the pool of items was administered to another group of church school teachers (N=24), and no further reduction of items was done. The pool of items was reduced on the basis of means and standard deviations obtained on the total item pools and item analysis obtained through the use of frequency of responses, item difficulty indices, and item discrimination indices.

After the final reduction of test items, a protocol was obtained consisting of fifty multiple-choice items coupled with four distractors for each question and one answer.

Reliability of the Test on Church Education

In each item reduction of the test item pool, reliability coefficients were obtained. These coefficients were all of the KR20 type and ranged from .87 to .62; and with the final fifty-item test, a reliability coefficient of .87 was obtained.

The final coefficient of .87 that was obtained indicated a most satisfactory reliability for a test of this type and no further item reduction was then contemplated.

Validity of the Test on Church Education

No validity coefficients for the TOCE instrument were computed. However, both content and item validity procedures were examined. Both from the item analyses and examination of the test, the evaluators were convinced that the Test on Church Education exhibited satisfactory content and item validity.

APPENDIX J

TREATMENT SCHEDULE

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TREATMENT SCHEDULE

Treatment A -- Laboratory Training

Subjects assigned to this treatment attended nine training sessions at the PACE Learning Laboratory, Scottsdale, Arizona. This Laboratory consists of a model classroom equipped with remotely-controlled videorecording equipment (two cameras mounted permanently, with microphones strategically located throughout the teaching area).

In Saturday sessions lasting three hours for each of five successive weeks, the teachers-in-training observed four demonstration teaching sessions (50 minutes each) in which students of the grade level in which they held primary interest were taught by master teachers, under the guidance of the Project Director. After viewing the sessions live on these Saturdays, the trainees returned to the Laboratory on a weekday evening for a two-hour session in which the VTR was viewed, analyzed, and discussed. Members of each training cell were randomly selected each week to return on the following Saturday and conduct a practice teaching session, with another group of youngsters -- but employing that same segment of instruction they had previously observed both live and on tape. Their own practice sessions were in turn videorecorded for immediate analysis. The Director provided critiques and also supplied instruction throughout the nine sessions.

Following is a breakdown of the general pattern of the training:

Saturday 1: Orientation, 1 hour; instruction on objectives, 1 hour; first live demonstration.

Weekday 1: Viewing and analyzing previous Saturday's VTR; instruction in concept development.

Saturday 2: Practice teaching, 1 hour; VTR analysis, 1 hour; second demonstration, 1 hour.

Weekday 2: Viewing and analyzing previous Saturday's VTR of demonstration; instruction on reinforcement theory.

Saturday 3: Practice teaching, 1 hour; VTR analysis, 1 hour; third demonstration, 1 hour.

Weekday 3: Viewing and analyzing previous Saturday's VTR of demonstration; instruction in use of media in the classroom.

Saturday 4: Practice teaching, 1 hour; VTR analysis, 1 hour; fourth demonstration, 1 hour.

Weekday 4: Viewing and analyzing previous Saturday's VTR of demonstration; instruction in inductive vs. deductive styles of teaching.

Saturday 5: Practice teaching, 1 hour; VTR analysis, 1 hour; review and evaluation, 1 hour. Presentation of attendance certificates.

Each week a different observation form was provided for the subjects' use. These forms were designed to lead into the general discussion topic for the following weekday session.

Critiques of the VTR's focused upon the quality of interaction in the classroom; structure of the teaching period; objectives achieved; general styles of teaching.

The same children returned weekly for the demonstration sessions and another group attended the practice sessions regularly. Thus the experience provided for each group of children a fairly complete four-week unit, and the teachers-in-training had opportunity to get to know them fairly well.

Curricular units were obtained predominantly from the nationally-prepared teaching materials of the United Methodist Church. Specific behavioral objectives and detailed lesson plans were developed weekly.

Treatment B -- INSTROTEACH Workshops

Subjects assigned to this group were provided training in a workshop of standardized format known as INSTROTEACH (from Instrument for the Observation

of Teaching Activities in the Church), a counterpart for church use of the IOTA workshop technique employed in public school circles.

The workshops were held toward the end of each experiment period, over two extended weekends. Instructors were staff members from the College of Education, Arizona State University, employed by the PACE Project on a consultative basis.

A typical workshop schedule followed this pattern:

First Friday night: Introduction to the workshop, followed by a study of the criterion (definition) embodied in a booklet entitled FIVE AREAS OF CHURCH TEACHER COMPETENCE, by R. Merwin Deever, Howard J. Demeke, Raymond E. Wochner, and Locke E. Bowman, Jr.

First Saturday: Review of the FIVE AREAS; study of the INSTROTEACH "instrument" (especially the first fourteen of the twenty-seven evaluative scales). Each scale was studied, as to content and structure. Through a process known as "film training" the participants were schooled in how to obtain objective data in a classroom observation; first use of the observation scales followed, on a simulated basis.

First Sunday: Teams of the workshop members visited in church classes in the Phoenix area, then "scored" the scales and compared their data and ratings; discussions led to team reconciliations.

During the week: Teams were assigned to public schools for one-hour observations to continue practice in use of the scales.

Second Friday night and Saturday: Reports on public school observations; study of "interview" scales in the instrument; practice in technique of interviewing to obtain data not directly discernible in classroom visitations; practice in "scale-building" (construction of additional scales, in order to get the feel of how such instruments are prepared).

Second Sunday: Another morning of church school observation, followed by closing luncheon, a program prepared by participants, presentation of evaluation committee report, and awarding of attendance certificates.

The workshop was presented as a "training experience" for the teachers. Explicit reference was made to the fact that the INSTROTEACH developers sought to provide a set of criteria whereby individual teachers could practice self-evaluation on a continuing basis. The rationale for the INSTROTEACH-type program is basically that self-evaluation leads to self-improvement, and that a measuring instrument such as these scales provide is usable as a self-evaluative tool.

Throughout the training procedure, considerable stress was laid on the need to avoid value judgments -- about teachers and teaching situations. Instead, the trainees were instructed to record data representing only what they had actually seen and heard (objective, valid evidence). The stress was upon the use of the INSTROTEACH Instrument to measure competence in observed teaching, not to arrive at judgments of any kind regarding the teacher himself.

Each workshop participant received for his own use a copy of the training manual, The Evaluation of Teaching Effectiveness in the Church.

Treatment C -- Control Group

Subjects assigned to this group were asked to continue teaching as they normally would. No specific training of any kind was provided, and they were not contacted until after each experiment period had ended.

APPENDIX K

INTERIM REPORT ON

PROJECT FOR THE ADVANCEMENT OF CHURCH EDUCATION

Submitted by

Frederick D. Levan

and

Thomas H. Metos

October, 1969

Scaling Observational Ratings. Each experimental or control subject was simultaneously rated on each of INSTROTEACH's 27 scales by two observers. After the ratings for each subject were recorded, the sigma scaling technique was used to equalize the scalar units. A subject's score was then determined by summing his 27 weights. The chief advantage of sigma scaling is that the units of the scale are equal and hence may be compared from item to item or from scale to scale. The transmutations were reported in the form of standard scores which were referable to means of 50 and sigmas of 10.

Results of Experiment I. Scalar data were summarized as enumerations in Table I. The reported means are standard-score oriented (i.e., parametric based); whereas, the summed ranks have a nonparametric orientation. Twenty-seven Kruskal-Wallis one-way analysis of variance H tests were executed to determine if significant differences existed among the three groups of differentially treated subjects with respect to their mean INSTROTEACH scores (viz., significant differences among the rank totals by scale). Only one H value fell within the region of rejection when an alpha level of .01 was utilized; however, if an alpha level of .05 had been chosen on an a priori basis, two additional significant differences would have been identified.

In a very real sense, the X_r^2 statistic which was used for tests of significance in Table III gave a clearer assessment of the overall experiment than was the case when the H statistic was calculated for the individual INSTROTEACH scales. When the standard scores were used for ranking purposes rather than the ordinal-type ratings which were used for H testing in Table I, and when the total standard scores for the groups

across all 27 scales were summed, an aggregate evaluation became possible. This sort of testing obviously had more power and efficiency. The findings were rather credible, and a definite greater-than-chance difference among rank totals (equivalently, mean ranks) was noted. The major differential was between experimental conditions A_1 and A_2. Friedman's two-way analysis of variance (viz., the X^2_r test) was also utilized to test for significant differences between individual pairs of summed ranks.

Interpretation of Experiment I. For the teacher-student planning scale (S_6), workshop participants as a group were rated significantly higher on the average than either laboratory or control subjects. In addition, workshop trainees exhibited higher ratings than laboratory-trained experimentals on S_1 (use of materials in teaching) and S_{22} (use of community resources); however, scalar results were considered to be of rather molecular importance when the experiment as a whole was the basic referent of concern. Using an aggregate focus, an overall evaluation suggested that the subjects' scores were not independent of the conditions. They were dependent on the conditions, and the large X^2_r value indicated that at least one of the treatment groups differed significantly from some other group. The difference was found between treatment groups A_1 and A_2. The subjects' scores in the workshop group (A_2) were superior to the scores assigned to the laboratory experimentals (A_1) by the project's 48 observers.

INTERIM ANALYSIS OF EXPERIMENT II*

Scaling Observational Ratings. As was the case with Experiment I, the sigma scaling technique was also used in Experiment II for the purpose of equalizing scale units. Through transmutations, each subject's total score was calculated by summing his 27 scalar weights referable to means of 50 and sigmas of 10. The observational ratings were inspected across all scales, and the hypothesis of a normal distribution was met. This hypothesis was also met in Experiment I. Since the distributions of standard scores are the same as raw score distributions, the assumptions of normal distributions held in both experiments. Needless to say, it was most encouraging to the experimenters to see that the observers were rating subjects so that no significant differences existed between observed and expected frequencies concerning scalar position when the hypothesis of a normal distribution was used as a referent. The allowance of this necessary assumption had important foresight-oriented implications related to the project's future data analysis plan.

Results of Experiment II. Fortunately, Experiment II's results were quite different from those of the first experiment. Such a contrast presented information which had pertinence to planned cross-validity checks. One H value reported in Table II met the rather stringent alpha level which had been chosen a priori. If the alpha level had been .05, one additional null would have been rejected. In reality, failure to reject 26 null hypotheses was experienced; however, as was true in Experiment I, the two-way analysis of variance test (viz., Friedman's X_r^2 test) of the aggregate

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*IMPORTANT NOTE: The data of Experiment II in this interim report is a combination of Experiments II and II as later analyzed for the main report. Thus, no comparison should be made between references to "Experiment II" herein with Experiment II in the main report.

mean rank differentials suggested a different disposition was in order when the experiment as a whole was considered as the referent of major concern. The $X^2_{\underline{r}}$ value which was generated was well within the region of rejection, and it was decided that a significant difference among rank totals (equivalently, mean ranks) was identified. Unlike the manifested single significant differential between pairs of summed ranks in the first experiment (i.e., between A_1 and A_2 with the workshop subject's mean scores being much higher), Experiment II's paired comparisons produced two differences which were significant, and these comparisons along with the overall statistical test results were reported as entries in Table III.

Interpretation of Experiment II. Both the workshop and laboratory subjects were rated much higher than the controls concerning opportunity for student participation (S_2). Additionally, A_1's (laboratory experimentals) had ratings scores which were superior to both the A_2 and A_3 treatment group subjects' ratings on the scale related to the recognition of learning difficulties, viz., S_{11}. In terms of an aggregate focus, the subjects who experienced conditions A_1 and A_2 received significantly higher mean scores than controls (A_3-condition subjects).

RESULTANT EXPLANATIONS OF EXPERIMENTS I AND II

The primary objective in both experiments was to study the effects of three different experimental conditions designated A_1, A_2, and A_3 upon the performance (i.e., performance both inside and outside the classroom) of volunteer church teachers. It was found that overall performance was dependent on condition. Group performance scores were referable to positions on underlying competency continua. Two or more treatment groups that had the same competency scores were at the same positions on the latent continua. Higher scores indicated high levels of competency (viz., highly desirable teacher behavior or activities), and lower scores were indicative of low competency levels. Since standard scores having means of 50 and sigmas of 10 were used in both experiments, a two-thirds majority of the subjects had scores between 40 and 60. It should be emphasized that raw scores were standardized afresh for each experiment.

INTERIM SUMMARY TABLE I
EXPERIMENT I
SCALAR COMPARISONS OF EXPERIMENTAL AND CONTROL GROUPS AFTER DIFFERENTIAL TREATMENT IN TERMS OF STANDARD SCORE MEANS, SUMS OF RANKS, AND H VALUES

Description of Scales	EXPERIMENTAL CONDITIONS: Laboratory (A_1) Means	Laboratory (A_1) Sums of Ranks	Workshop (A_2) Means	Workshop (A_2) Sums of Ranks	Control (A_3) Means	Control (A_3) Sums of Ranks	Statistical Values H
Observation Scales							
1. Use of Materials in Teaching	44.5	68.0	56.9	137.5	49.3	94.5	7.07
2. Opportunity for Student Participation	47.9	85.0	53.9	120.0	48.6	95.0	1.95
3. Attitude Toward Opinion	52.3	111.0	52.3	111.0	45.5	78.0	3.70
4. Classroom Control	46.6	81.0	54.8	124.0	50.4	93.0	1.63
5. Developing the Physical Environment	47.8	87.0	54.6	124.5	47.6	88.5	4.18
6. Teacher-Student Planning	45.0	72.5	59.4	149.0	47.3	78.5	19.26*
7. Teacher Preparation for Classroom Session	49.3	92.0	51.0	99.0	52.3	109.0	0.43
8. Variety in Learning Activities	49.0	89.0	52.8	116.0	48.9	95.0	1.13
9. Relation of Church Subject Matter to Life Situations	48.3	89.5	49.4	93.5	53.8	117.0	1.19
10. Student Inquiry Into Subject Matter	48.5	87.5	54.0	119.5	50.4	93.0	1.67
11. Recognition of Learning Difficulties	43.8	64.0	53.8	120.0	52.6	116.0	5.34
12. Social Climate	50.3	113.0	49.0	95.0	46.9	92.0	0.66
13. Classroom Activities to Encourage Christian Action	49.4	94.0	48.4	89.0	53.8	117.0	1.21
14. Developing Student Skills in Interpretation of the Bible	50.0	87.5	49.4	84.5	56.4	128.0	3.47
Interview Scales							
15. Evaluation of Individual Student Progress	51.4	103.0	53.3	118.0	45.8	79.0	2.11
16. Awareness of Peer Relationships	46.5	80.0	54.3	122.0	48.8	95.0	0.82
17. Personal Relationships with Individual Students	45.9	79.0	50.8	100.0	53.3	121.0	2.33
18. Development of Student Self-Concept	43.0	64.0	54.0	124.0	53.0	112.0	5.65
19. Cooperation with Professional Church Staff in Counseling Problems	49.0	91.0	48.5	91.0	52.8	118.0	1.35
20. Participation in Life of the Church	49.4	93.5	53.1	116.5	47.9	90.0	1.64
21. Parent Orientation to Church Education	47.5	87.0	53.4	123.5	49.0	89.5	2.28
22. Use of Community Resources	43.0	61.0	56.8	136.0	50.3	103.0	7.79
23. Community Involvement	49.9	79.0	48.6	91.0	55.5	130.0	4.48
24. Program of Personal Study	52.9	109.5	52.3	110.0	47.6	80.5	1.61
25. Relation of Classroom Program to Over-All Aims of Parish Education	48.5	89.0	52.5	118.0	48.5	93.0	1.34
26. Participation in Staff Planning	48.8	95.0	48.8	99.0	51.1	106.0	0.19
27. Responsibility for Improvement of Teaching Skill	48.9	94.5	51.0	111.0	48.9	94.5	0.58

*Significant at .01 level

INTERIM SUMMARY TABLE II
EXPERIMENT II*
SCALAR COMPARISONS OF EXPERIMENTAL AND CONTROL GROUPS AFTER DIFFERENTIAL TREATMENT IN TERMS OF STANDARD SCORE MEANS, SUMS OF RANKS, AND H VALUES

Description of Scales	EXPERIMENTAL CONDITIONS: Laboratory (A_1) Means	Laboratory (A_1) Sums of Ranks	Workshop (A_2) Means	Workshop (A_2) Sums of Ranks	Control (A_3) Means	Control (A_3) Sums of Ranks	Statistical Values H
Observation Scales							
1. Use of Materials in Teaching	55.5	130.5	50.1	102.5	43.8	67.0	5.70
2. Opportunity for Student Participation	46.0	101.0	54.0	140.0	41.8	59.0	10.43**
3. Attitude Toward Opinion	49.5	103.0	50.0	107.0	47.8	90.0	0.38
4. Classroom Control	51.8	107.5	50.1	104.0	48.5	88.5	0.34
5. Developing the Physical Environment	53.8	116.0	50.8	104.0	46.5	80.0	1.58
6. Teacher-Student Planning	51.1	106.0	52.8	114.5	46.1	79.5	1.96
7. Teacher Preparation for Classroom Session	50.8	104.0	51.0	107.5	48.0	88.5	0.37
8. Variety in Learning Activities	52.6	113.5	50.8	104.0	46.9	82.5	1.66
9. Relation of Church Subject Matter to Life Situations	52.1	112.5	46.9	85.0	50.1	102.5	1.16
10. Student Inquiry Into Subject Matter	50.5	103.0	48.3	91.0	52.3	106.0	0.39
11. Recognition of Learning Difficulties	54.4	131.0	49.5	93.5	47.0	81.5	6.80
12. Social Climate	53.0	114.5	49.8	96.0	47.4	89.5	0.84
13. Classroom Activities to Encourage Christian Action	46.8	80.0	54.9	128.5	49.4	91.5	3.16
14. Developing Student Skills in Interpretation of the Bible	46.8	104.0	52.5	128.5	44.5	67.5	4.86
Interview Scales							
15. Evaluation of Individual Student Progress	48.9	91.0	51.5	108.5	51.5	100.5	0.37
16. Awareness of Peer Relationships	53.4	113.0	52.1	103.0	48.3	84.0	1.25
17. Personal Relationships with Individual Students	52.4	90.0	56.0	129.0	48.8	82.0	3.75
18. Development of Student Self-Concept	51.0	106.0	51.4	106.0	47.8	88.0	0.55
19. Cooperation with Professional Church Staff in Counseling Problems	44.1	94.0	46.5	104.5	48.8	101.5	0.16
20. Participation in Life of the Church	46.3	82.0	53.4	121.5	49.0	97.0	3.52
21. Parent Orientation to Church Education	49.9	101.0	53.1	117.5	47.0	81.5	1.88
22. Use of Community Resources	48.9	108.5	46.9	103.5	44.5	88.0	0.49
23. Community Involvement	49.3	94.0	52.0	117.0	48.3	89.5	1.40
24. Program of Personal Study	54.6	128.5	47.1	83.0	48.0	88.5	3.25
25. Relation of Classroom Program to Over-All Aims of Parish Education	50.0	95.0	50.0	101.0	51.4	104.0	0.13
26. Participation in Staff Planning	48.0	87.5	52.8	116.0	49.1	96.5	1.46
27. Responsibility for Improvement of Teaching Skill	49.3	105.0	47.9	106.0	45.9	89.0	0.61

*This represents a combination of data from Experiments labeled II and III in the main report.
**Significant at .01 level.

INTERIM SUMMARY TABLE III

EXPERIMENTS I AND II*

AGGREGATE COMPARISONS OF EXPERIMENTAL AND CONTROL GROUPS AFTER DIFFERENTIAL TREATMENT IN TERMS OF SUMS OF RANKS AND χ^2_r VALUES

	Experimental Conditions			Statistical Values
	Laboratory (A_1)	Workshop (A_2)	Control (A_3)	
Experiments	Sums of Ranks	Sums of Ranks	Sums of Ranks	χ^2_r
Experiment I $A_2 > A_1$	41.0	67.0	54.0	12.18†
Experiment II $A_1 > A_3$ $A_2 > A_3$	61.5	62.0	38.5	13.01†

*See footnote re the designation, "Experiment II," on page 219.

†Sigrificant at .01 level.

INTERIM ANALYSIS OF EXPERIMENT III*

Scaling Observational Ratings. Experiment III differed dramatically from Experiments I and II. It was structured around a statistical model which had a two-sample case, related samples. In the two previous experiments, the statistical models had k-sample cases, independent samples. In addition, differential gain between the subjects who experienced treatment was of no concern; however, in Experiment III, the question of whether or not differential gain was independent of the experimental conditions was of primary concern. In this particular repeated-measures study, the subjects' pretest scores were the scores previously assigned to them by both Experiment I's and II's observers. Change was defined as the differences in standard scores, standardized afresh (separately) for the before-and-after measures. The change model was symbolized as $z_{2i}-z_{1i}$. All subjects in this experiment had previously served as controls in the prior experiments.

Results of Experiment III. Using the aggregate referent (viz., the total mean differences of the two treatment groups), the gain differential between the laboratory and workshop groups was explained-away in terms of chance fluctuations in random sampling. The required U value of zero for significance at the a priori .05 level was not attained when the overall focus was utilized. In contrast to the aggregate test, several significant differences in gain scores were identified in Table IV. Differences were noted between the two groups on five scales, viz., S_5, S_6, S_{13}, S_{17}, and S_{26}. Ordinarily, the overall test would cancel-out the scale-level comparisons, but with an N of seven ($n_1=2$, $n_2=5$) the molecular comparisons were considered worthwhile. The experimenters were after results which would assist them

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*This experiment is identified as Experiment IV in the main report.

in the formulation of tenable assumptions for further testing when the replicates were complete. Interim analysis was not particularly recommended in the case of Experiment III.

Interpretation of Experiment III. The subjects who experienced the laboratory treatment (A_1) exhibited higher positive gain scores than workshop-trained subjects (A_2) in the areas of teacher-student planning and the utilization of classroom activities to encourage Christian action, that is, on INSTROTEACH's observational scales 6 and 13. In contrast, A_2 experimentals were superior to A_1 experimentals in the areas of developing the physical environment, personal relationships with individual students, and participation in staff planning (scales 5, 17, and 26).

INTERIM SUMMARY TABLE IV
EXPERIMENT III*
COMPARISONS OF DIFFERENTIAL TREATMENT GROUPS IN TERMS OF
MEAN PRE TEST - POST TEST DIFFERENCE SCORES

Description of Scales	EXPERIMENTAL CONDITIONS: Laboratory (A_1) Mean Differences	EXPERIMENTAL CONDITIONS: Workshop (A_2) Mean Differences	Statistical Values U
Observation Scales			
1. Use of Materials in Teaching	17.0	- 8.5	1
2. Opportunity for Student Participation	7.0	- 3.5	2
3. Attitude Toward Opinion	8.8	-11.0	2
4. Classroom Control	2.0	- 5.0	3
5. Developing the Physical Environment	- 3.5	9.5	0**
6. Teacher-Student Planning	10.2	- 5.0	0**
7. Teacher Preparation for Classroom Session	6.0	- 3.0	2
8. Variety in Learning Activities	3.2	1.5	5
9. Relation of Church Subject Matter to Life Situations	0.4	-10.0	1
10. Student Inquiry Into Subject Matter	9.8	-16.0	1
11. Recognition of Learning Difficulties	- 2.0	5.5	3
12. Social Climate	6.8	-23.0	1
13. Classroom Activities to Encourage Christian Action	5.6	-17.0	0**
14. Developing Student Skills in Interpretation of the Bible	5.6	-11.5	1
Interview Scales			
15. Evaluation of Individual Student Progress	- 6.0	8.0	3
16. Awareness of Peer Relationships	5.2	-10.5	2
17. Personal Relationships with Individual Students	- 9.6	18.0	0**
18. Development of Student Self-Concept	- 1.0	8.5	3
19. Cooperation with Professional Church Staff in Counseling Problems	- 1.4	-13.0	2
20. Participation in Life of the Church	9.4	- 8.5	2
21. Parent Orientation to Church Education	- 0.4	0.0	5
22. Use of Community Resources	- 4.2	1.5	2
23. Community Involvement	- 1.2	9.0	1
24. Program of Personal Study	2.8	12.0	2
25 Relation of Classroom Program to Over-All Aims of Parish Education	5.0	- 7.5	1
26. Participation in Staff Planning	- 1.8	10.0	0**
27. Responsibility for Improvement of Teaching Skill	5.0	- 1.5	1
Aggregate	66.0	73.4	3

*This is "Experiment IV" in the main report.

**Significant at .05 level.